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An Empirical Analysis of Cotton Cultivation in the Southern Districts of Tamil Nadu

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Abstract:

The cotton processing industry holds a significant position in the Indian economy as the second-largest labor-intensive activity after agriculture, providing direct and indirect employment to the Indian population. Given the commercial importance of cotton at the National and State levels, there is a recognized need to thoroughly examine the cotton value chain, which includes producers and various stakeholders. Hence this study was proposed and conducted in 2022 covering cotton growers, ginners, spinners and weavers in Coimbatore district. Cotton production in Tamil Nadu has increased by 10% in 2022–23 compared to the previous year, according to the Tamil Nadu Agricultural University. A statement from TNAU said that cotton cultivation has expanded to 1.62 lakh hectares with a production of 3.56 lakh bales during the 2022-23 season, marking a 10% increase in acreage compared to the previous year. The rise in cultivation is seen across all minor and major cotton producing districts like Perambalur, Salem, Dharmapuri, Ariyalur, Trichy, Virudhunagar, Madurai and Cuddalore. TNAU said that according to the Union ministry of Textiles, cotton cultivation has spiked throughout the country. Cotton was cultivated in 130.61 lakh hec with a production of 343.47 lakh bales during the 2022-23 season, marking a 6% expansion in acreage compared to the previous year.

Keywords: Rainfed Cotton, Ginning; Spinning; Weaving; Oil mill; Profitability.

1. Introduction

Cotton is a traditional and important cash crop. Cotton was cultivated about 7,000 years ago, by the inhabitants of the Indus Valley Civilization, which covered parts of Eastern Pakistan and North- western India. Clothes play an important role in Civilized society. From earliest times clothes are the basic necessity of a man after food [1]. In India, cotton provides a direct livelihood to 6 million farmers, and approximately 40 to 50 million people are employed in the cotton trade and its processing. It has a direct linkage with the Industrial sector like textile, oil mill and the livestock sector. The ecosystem is more vulnerable to the effects of climate change. Farmers are professionals who totally engage the ecosystem for their livelihood activities, especially farmers in dry land regions. Tamil Nadu textiles and clothing industry predominantly cotton-based, accounts for one-third of the textile business size, 45% of the spinning capacity, 70% of the knitted garment capacity, 40% of the home textiles manufacturing capacity, 22% of the power loom capacity, 12% of handloom capacity of India. It is the only State having presence across the whole textile value chain. The actual annual cotton requirement of the textile industry in Tamil Nadu is around 120 lakh bales (170 kgs per bale) while the State hardly produces 4 to 6 lakh bales from 1.12 lakh ha of area under cotton, of which 76% of the cotton area under rainfed situation. The major rainfed cotton-cultivating districts in Tamil Nadu are Virudhunagar, Thiruchirapalli, Perambalur, and Madurai. Among these districts, Virudhunagar district is a drought prone area receiving an annual

rainfall of 777.1 mm. Therefore, rainfed farming contributes a major percentage in the total agriculture area. The change in climate has been perceived with more emphasis since the beginning of the 21st century. Since its effects cause direct effects on ecosystems and agriculture, especially farmers of the dry land regions. Hence, the present study was undertaken with the specific objective of estimating the cost and returns of cotton processing at different level in cotton value chain.

2. Materials and Methods

Two stage purposive and random sampling methods were used in the selection of the study district, block, and sample respondents for the present study using area under rainfed cotton as one of the major criteria. At first, the district was selected purposefully since it possesses 19.40% of area under rainfed cotton three blocks namely Aruppukottai, Virudhunagar and Srivilliputhur, were selected purposefully since it possesses 22.43%, 13.65% and 13.29% of area under rainfed cotton respectively. In production of cotton cloth material as final product, cotton surpasses ginning, spinning and weaving processes. These three stages were specifically considered for the present study. Cotton seed oil is another product received from cotton. Lint and seed are the major products received from cotton kapas. From 33 kg of lint, 27.51 kg of cloth is being produced, with the total loss of 5.49 kg of lint when it moves from ginning (0.54% of waste), spinning (4.95% of waste). Data related to cropping patterns, cost of cultivation, net return, gross return, input cost, buying price, selling price, and other relevant factors were collected from the farmers and other stakeholders in cotton value chain. Additionally, information on the cost of raw materials, processing, returns, and value addition by the processors were gathered to estimate the economics of the production, marketing and processing activities of rainfed cotton.

The percentage and cost and returns analysis were employed to assess the efficiencies stakeholders of different cotton production, marketing and processing. The analysis encompassed the costs of production, marketing processing, and the returns generated at each stage, in its value chain. In this study, value addition and net value addition in cotton was estimated as discussed below.
Value addition is the difference between the value of end product and the value of the raw material. Value addition= Value of end product- Value of raw material and Net Value addition is the difference between the value of end product and the value of the raw material plus cost of processing.

Net Value addition= [Value of end product- (Value of the raw material+ Cost of processing)] [3].

3. Results and Discussion

3.1 General Characteristics of Sample Farmers

The general characteristics of the sample farm households, the average age was 54 years in the study area with average schooling of eight years which implied that the sample respondents had lower level of education and had less awareness in the adoption of recommended technologies in a suitable manner in cotton cultivation. The average farming experience of the sample respondents was 13 years. The average size of land holdings of the sample respondents was 3.38 ha with average area under cotton 1.13 ha. Hence it showed that small farmers were predominant in study area. Among all the cotton varieties, the major average area was under RCH 659 variety with 0.72 ha followed by others.

3.2 Identify and Outline the Cotton Value Chain

The cotton value chain in the study area consists of different stakeholders, including farmers, ginning mills, spinning mills and weaving mills [4]. At the beginning of the chain, farmers serve as cotton seed producers. As first level of processing cotton kapas is removed from its stalk, grading which is the preliminary stage in value addition also the varieties preferred by farmers with an aim to earn higher profit. They sell their harvested output, known as "kapas," to

ginners through commission agents to some extent by their own. Cotton seeds, which are separated from cotton lint during the ginning process, undergo further processing in mills. These mills reduce the seeds into four products: cottonseed oil, linters, hulls and oil cake [5].

The lint is then transported to textile mills which undergo spinning to produce yarn and subsequently woven into various types of fabric and the by-product, the seed, is directed to oil mills. Spinning is the next stage after ginning in the cotton processing chain which play a crucial role in the textile industry by creating yarn that is used for various textile applications, including weaving, knitting, and other processes. Weaving mill processing is a crucial aspect of the textile industry which serves as a significant role by converting yarn into a diverse range of woven fabrics [6].

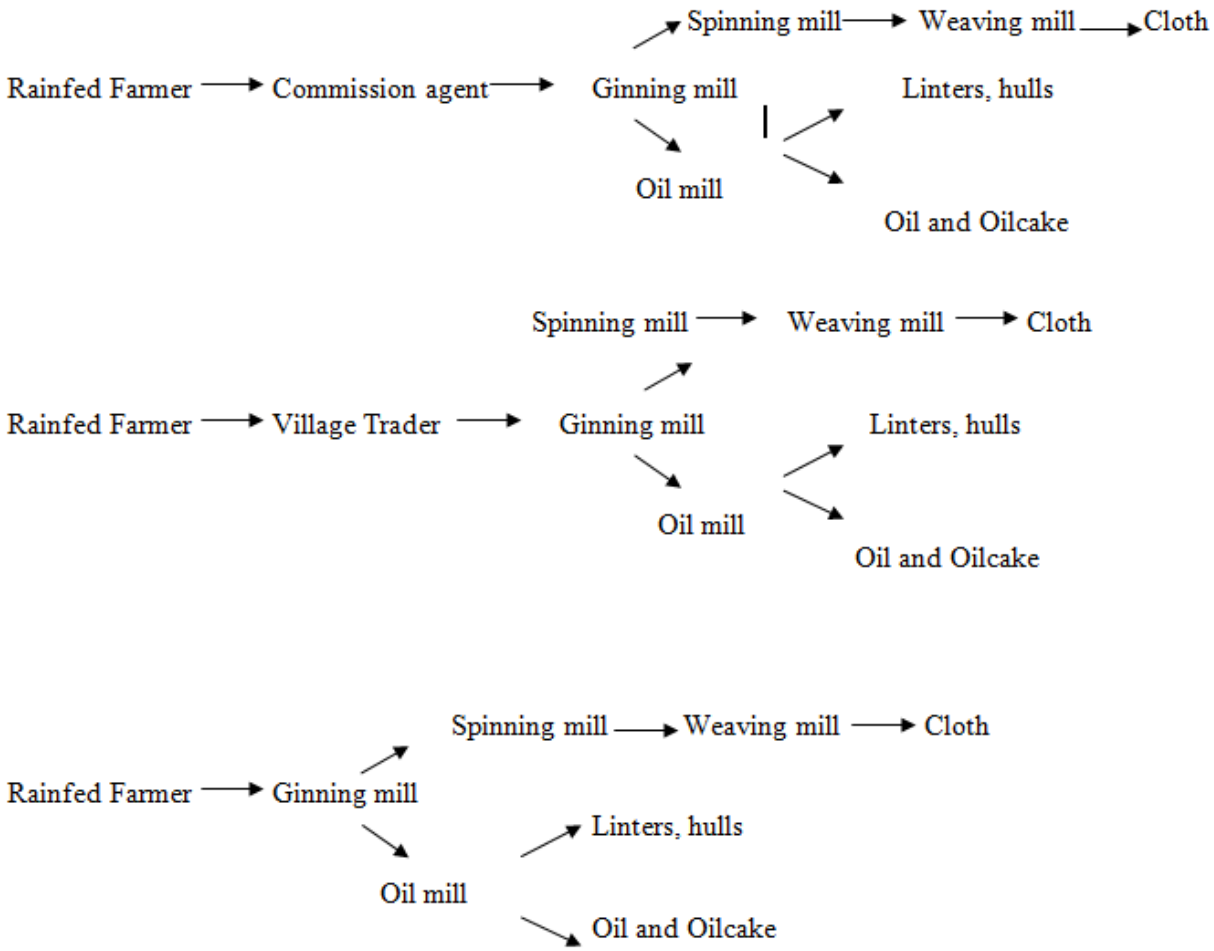
3.3 Cost and Returns of Cotton processing at different Level in Cotton Velum Chain

The cost of cultivation of cotton computed from the data collected from sample farmers of Virudhunagar district revealed that the average total cost per hectare of rainfed cotton was Rs 120755.60 of which variable cost constituted 80.59%, followed by fixed cost around 12.42% and total marketing cost around 6.99% [7]. The total cost of production to produce one quintal of cotton was Rs.6708.63 comprising variable cost of Rs.5406.71 and a fixed cost of Rs. 833.33 per quintal [8]. The sample farmers in Virudhunagar district has incurred Rs.8434.62 as the marketing cost of rainfed cotton of which commission charges (Rs.4019.40) was the major component which was accounting for 3.28% followed by post harvest activities cost (Rs.1802.16), transportation cost (Rs.1443.60), packing charges (Rs.543.78), loading and unloading charges(Rs.453.78) and weighing charges (Rs.171.90) accounting for 1.49,1.19, 0.45, 0.37 and 0.14% of the total marketing cost, respectively. The marketing cost per quintal of rainfed cotton in Virudhunaga district was estimated as Rs.468.59 of which commission charges and post harvest operation costs (Rs.100.12), transportation cost (Rs. 80.20), packing charges (Rs. 30.21), loading and unloading charges (Rs. 25.21), and weighing charges (Rs. 9.55) accounting for 1.49,1.19, 0.45, 0.37 and 0.14%, respectively. The gross return per hectare of rainfed cotton cultivation was Rs.134038.80 with Rs.7446.60 as per quintal return**.** The net return obtained per hectare and per quintal of cotton over cost were Rs.13283.2 per hectare and Rs.737.95 per quintal, respectively with B:C ratio 1.11.

3.3.1 Cost and returns of ginning process

Ginning Process is needed to separate the lint and seed. At First stage, the cotton is getting prepared for its value chain. The first step in the ginning process is where the cotton is vacuumed into tubes that carry it to a dryer, grading and checking the quality of the cotton are the activities carried out to in the ginning unit [10].

Figure. 1. Flow diagram of rainfed cotton chain



3.3.3 Cost and returns of weaving process

Weaving is needed to convert the yarn into fabrics. Grading, storing and pre testing are the activities done before the processing of yarn.

In the weaving unit, power loom technology was used, producing 30 meters per second at 150rpm. It consumed 33 kilowatts of electricity. Raw material cost (84.47%) constitutes the major one. Fixed cost includes (Depreciation on buildings, machines and equipments, salary to permanent staff and license fee) and Variable cost includes (electricity charges, repair and maintenance, office maintenance, wages to casual labour, telephone charges and packing material). The total cost incurred in the process of grading, storing and pre–testing activities was Rs.250.00. The average total cost incurred in the processing of yarn into fabric was Rs. 31975.02 per quintal. Transportation cost (0.85%) constitutes the major one followed by sales tax and loading and unloading charges respectively in marketing cost. The gross returns obtained from processing (weaving) one quintal of yarn were Rs.48934 primarily consisting of returns from fabric (Rs. 48774) and wastage (Rs.160). The value addition in the process amounted to Rs.21791.14. The net value added as a result of processing yarn into fabric was Rs.17635.45 per quintal of yarn processed. The resulting benefit-cost ratio was 1.52 [11].

3.4 Financial Profitability of Agents

The analysis of the cotton value chain indicates that rainfed cotton production and processing, under the current price and cost settings, are profitable [12]. Among all the members in the chain, weavers possess the highest benefit-cost ratio of 1.52, securing the first profitability rank since it moves in value chain the processors in higher order processing they are earning higher profit as the fabric form of product is converted into high value (cloth) commodity. The second profitability rank was occupied by spinners with a benefit-cost ratio of 1.47 followed by ginners and farmers with benefit-cost ratio of 1.35 and 1.11 respectively.

4. Conclusion

From the results derived from the study and by comparing with the reviewed studies, it is opined that cotton farmers who are the starting point in value chain can reap more profit by growing cotton for which irrigation facilities can be provided to take up extra long staple cotton hybrids preferred by the cotton mills for getting increased yield and higher prices than at the present thus maintaining the sustainability of the cotton system in southern districts. The next stakeholder in the value chain, it is recommended to upgrade saw ginning technology, reducing wastage and enhancing lint quality. For spinning, friction spinning technology is recommended for higher quality output and reduced energy consumption. In weaving sector, air jet loom technology can be introduced. In essence, technology in these industries encompasses the use of innovative tools and processes to optimize production, improve quality, and enhance overall efficiency.

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