**Original Research Article**

# ECONOMIC ANALYSIS OF COTTON CULTIVATION IN ADILABAD AND NALGONDA DISTRICTS OF TELANGANA


## ABSTRACT

Cotton plays a significant role in livelihood of cotton farmers and unskilled workers who depends on cotton textile industry. Knowing the cotton crop's profitability at the farmer level is therefore equally crucial. The economics of cotton farming in two leading cotton-growing districts of Telangana in the years 2021-2022 were analysed and compared in this study. The study is based on primary data that was gathered using a pretested schedule from a sample of 120 farmers, with 60 of them coming from each chosen district. The study showed that cost of cultivation per hectare in Adilabad was Rs. 99,077.86 which is more than Nalgonda districts which was Rs. 93,884.78/ha and net revenue generated by cultivation was also following the same trend which was Rs. 25,394.54/ha in Adilabad and Rs. 18,521.97/ha in Nalgonda district. It can be concluded from the study that the cost of cultivation of cotton is increasing because of inappropriate usage of the input and cultivation become less remunerative for cultivators. It is necessary that extension system to take lead role in creating awareness about optimal utilization of the resources.



**Keywords:** Cotton cultivation, Economics, Telangana, Cost C2 and Net returns


## Introduction:

Cotton, is a multipurpose crop grown under various agro-climatic conditions (Reddy *et al*. 2020). Nearly 25 per cent of the world's total production of fibers is cotton. It contributes significantly to India's sustainable economy and to the livelihood of the country's cotton farmers. The most popular fiber used by Indian textile mills as a primary raw material is cotton. Cotton accounts for over 60 per cent of the raw materials consumed by the Indian apparel sector. India grows all 4 cultivated species of cotton *Gossypium arboreum* and *Gossypium herbaceum* (Asian cotton), *G.barbadense* (Egyptian cotton) and *G. Hirsutum* (American upland cotton), in addition to their intra and inter specific hybrids on the commercial scale (Chockalingam, 2016, and Annual Report, Ministry of Textile, 2020-21).

### National cotton scenario

In terms of area (130.49 lakh hectares) and production (329.96 lakh bales), India tops the list of the largest cotton-producing nations in the globe, contributing approximately nearly

40 per cent of total production and 23 per cent of total acreage under cotton. States that cultivate the most cotton include Gujarat, Maharashtra, Telangana, Rajasthan, Karnataka, Madhya Pradesh, Andhra Pradesh and Haryana. Furthermore, some of the non-traditional regions, like West Bengal, Orissa, Assam and Bihar also practice cotton production. (Beeraladinni *et al.* 2016).

Table 1 depicted that among all cotton growing states, Gujarat occupies first place by producing 87.12 lakh bales from 24.49 lakh hectares. Maharashtra producing 81.85 lakh bales in 42.29 lakh hectares and Telangana is producing 54.41 lakh bales from an area 20.24 lakh hectares. These are the three major cotton producing states, contributing around 60 per cent and 70 per cent to the country's production and area respectively (Cotton Corporation of India & indiastat.com).

**Table 1: Statistics of cotton cultivation in India in the year 2022-2023**

| States | Area (Lakh hectares) | Production (Lakh bales) | Productivity (kg/ha) |
|---|---|---|---|
| Andhra Pradesh | 6.95 | 18.85 | 461.08 |
| Gujarat | 24.49 | 87.12 | 581.03 |
| Haryana | 6.47 | 17.20 | 451.93 |
| Karnataka | 8.97 | 21.48 | 407.09 |
| Madhya Pradesh | 5.99 | 15.19 | 431.10 |
| Maharashtra | 42.29 | 81.85 | 329.03 |
| Odisha | 2.16 | 7.23 | 569.03 |
| Punjab | 2.41 | 4.54 | 320.25 |
| Rajasthan | 7.77 | 25.51 | 558.13 |
| Tamil Nadu | 1.56 | 3.56 | 387.95 |
| Telangana | 20.24 | 54.41 | 457.00 |

Source: www.indiastat.com

**Cotton production in Telangana**

In terms of area as well as production, Telangana is the third-largest cotton-producing state in the country. During 2022–2023, Telangana produced 54.41 lakh bales of cotton over an acreage of 20.24 lakh hectares. Table 2 provides information on the acreage, production, and yield of cotton in Telangana's major cotton-producing districts. Districts namely Nalgonda, Adilabad, Sangareddy, Nagarkurnool, Kumuram Bheem, Khammam, Vikarabad, Jougulamba Gadwal, Narayanpet, and Nirmal are the main cotton-growing areas. The Nalgonda district recorded the highest cotton production of 6.04 lakh bales from 2.65 lakh hectares. Adilabad

ranked second in production with 4.02 lakh bales from 1.57 lakh hectares (Planning Department, Government of Telangana's state statistical abstract, 2021-22).

**Table 2: Statistics of cotton cultivation in Telangana state 2021-2022**

| Districts | Area (Lakh hectares) | Production (Lakh bales) | Productivity (kg/ha) |
|---|---|---|---|
| Nalgonda | 2.65 | 6.04 | 387.79 |
| Adilabad | 1.57 | 4.02 | 434.72 |
| Sangareddy | 1.46 | 3.34 | 387.79 |
| Nagarkurnool | 1.43 | 2.95 | 350.74 |
| Kumuram Bheem | 1.26 | 3.43 | 461.89 |
| Khammam | 0.79 | 2.23 | 479.18 |
| Vikarabad | 0.77 | 1.74 | 382.85 |
| Jougulamba Gadwal | 0.77 | 2.03 | 444.60 |
| Narayanpet | 0.67 | 1.89 | 476.71 |
| Nirmal | 0.66 | 1.32 | 340.86 |

Source: www.tsdps.telangana.gov.

## METHODOLOGY

### a. Sampling method

Adilabad and Nalgonda districts were specifically chosen for the study since they are the main cotton-producing regions in the state. A multistage random selection approach was utilized to choose the districts, mandals, villages, and eventually the respondents. Two mandals-one with high production and the other with low production-were picked under each district, and the villages within each mandal were chosen using the same methodology. Eight villages in all were selected from four mandals, two districts, and fifteen farmers from each village, for a total of 120 farmers. The essential information was obtained using a pretested schedule by employing personal interview (Bellundagi *et al.* 2017).

### b. Analytical tools employed

Descriptive statistics, including averages, percentages, and other basic statistical techniques, were utilized in the study to produce results that were easy to comprehend. The cost of cultivation was divided into two categories variable cost, which is going to vary with level of production and fixed cost which does not vary with level of production. Various cost concepts and different farm income measures were also estimated (Hamsa *et al.* 2017).

## RESULTS AND DISCUSSION

### a. Costs and returns of cotton cultivation in the study area

The variable and the fixed cost incurred during cultivation of cotton in the chosen districts was shown in the table 3. The per hectare cost of cultivation in Adilabad and Nalgonda

districts were Rs. 99,077.86 $ha^{-1}$ and Rs. 93,884.78 $ha^{-1}$ respectively. It was found Adilabad farmers incurred Rs. 5,193.08 $ha^{-1}$ more cost compared to Nalgonda farmers. In the districts of Adilabad and Nalgonda, the percentage of variable and fixed expenses in the total cost of cultivation was, respectively, 77.42 and 22.58 per cent and 79.47 and 20.53 per cent.

Hired human labour costs made up the majority of the variable costs in both districts (Fig. 1). This was primarily driven by the requirement of more workers for tasks like sowing, applying fertilizer and plant protection chemicals, weeding and picking/harvesting. The human labours cost was Rs. 29,293.79 $ha^{-1}$ in Adilabad and Rs. 30,257.91 $ha^{-1}$ in Nalgonda district out of total labour expenses the major share obtained by hired labour. It was found that labour cost is slightly less in Adilabad compared to Nalgonda district. Kumar *et al*. (2019) and Reddy *et al*. (2018) also found the similar results in their studies.

Expenditure on the bullock labour in Adilabad and Nalgonda districts accounted 5.83 per cent and 5.13 per cent. It was noticed that bullock labour utilization was more in Adilabad district (5.83%) when compared to Nalgonda district (5.13%). This is because, frequent inter cultivation practices were taken in Adilabad district. The expenditure on machine labour was Rs. 7,652.06 $ha^{-1}$ in Nalgonda and Rs. 7,405.47 $ha^{-1}$ in Adilabad. Machine labour usage in both districts is quite more because, most of the land preparation activities like ploughing, clod crushing and harrowing were done using the tractor. Bullock labour is mostly restricted to inter cultivation operations.

Comparing the two districts, the cost of chemicals for plant protection was much higher in Adilabad Rs. 14,326.00 $ha^{-1}$ accounted 14.46 per cent of total expenses and in Nalgonda Rs. 9,715.33 $ha^{-1}$ accounted 10.35 per cent. This was mostly due to the fact that many cultivators were applying more than the advised dosage of the pesticides to protect their crop from pink bollworm and other pests and diseases infestation. Fertilizer cost was high in Nalgonda (Rs. 10,578.19/ha) as compared to Adilabad (Rs. 9,255.34/ha) and expenditure on seeds was also more in Nalgonda Rs. 5,496.16 $ha^{-1}$ accounting 5.85 per cent of the total expenses compared to Adilabad (Rs. 3,454.30/ha) this is mainly because in Nalgonda districts cotton being grown in red soil, farmers were applying more fertilizer and using more than recommended seed quantity. Kerur *et al*. (2015) and Reddy *et al*. (2020) were also remarked similar results in their studies.

In fixed costs, rental value of land accounts maximum share, which was Rs. 14,614.17 $ha^{-1}$ in Adilabad and Rs. 12,350.00 $ha^{-1}$ in Nalgonda. It was noticed that rent for leased land

was significantly high in Adilabad Rs. 3,705.00 $ha^{-1}$ contrast to Nalgonda Rs. 2,964.00 $ha^{-1}$. As Adilabad is dominated by the black soils which is best suited for cotton, soybean and maize, all of which are primary crops of the district, this accord higher rental value per unit land. IFC (Interest on fixed capital) was calculated at 10 per cent accounted Rs. 2,832.50 and Rs. 2,577.18 $ha^{-1}$ and depreciation accounted Rs. 1,222.49 and Rs. 1,383.75 $ha^{-1}$ in Adilabad and Nalgonda respectively. Overall fixed expenditure was more in Adilabad Rs. 22,374.15 $ha^{-1}$ contrast to Nalgonda district (Rs. 19,274.94/ha). Shelke *et al* (2016) and Radhika and Kumari (2015) obtained similar outcomes in their respective studies.

**Table 3: Cost of cultivation of cotton (in Rupees per hectare)**

| **Particulars** | **Adilabad** | | **Nalgonda** | |
|---|---|---|---|---|
| | **(Rs./ha)** | **%** | **(Rs./ha)** | **%** |
| **A. Variable Costs** | | | | |
| **a. Labour Costs** | | | | |
| Hired labour | 23,302.39 | 23.52 | 24,096.91 | 25.67 |
| Family labour | 5991.40 | 6.05 | 6,161.00 | 6.56 |
| Animal labour | 5,771.57 | 5.83 | 4,816.50 | 5.13 |
| Machine labour | 7,405.47 | 7.47 | 7,652.06 | 8.15 |
| **b. Material Costs** | | | | |
| Seed | 3,454.30 | 3.49 | 5,496.16 | 5.85 |
| FYM | 4,343.08 | 4.38 | 3,252.94 | 3.46 |
| Fertilizer | 9,255.34 | 9.34 | 10,578.19 | 11.27 |
| Plant protection chemical | 14,326.00 | 14.46 | 9,715.33 | 10.35 |
| Irrigation charges | 450 | 0.45 | 480 | 0.51 |
| Interest on variable capital @ 7% | 2,404.17 | 2.43 | 2,360.75 | 2.51 |
| Total variable cost | 76,703.71 | 77.42 | 74,609.85 | 79.47 |
| **B. Fixed Costs** | | | | |
| Rental value of land | 14,614.17 | 14.75 | 12,350.00 | 13.15 |
| Rent paid for leased in-land | 3,705.00 | 3.74 | 2,964.00 | 3.16 |

| | | | | |
|---|---|---|---|---|
| Depreciation | 1,222.49 | 1.23 | 1,383.75 | 1.47 |
| Interest on fixed capital @ 10 % | 2,832.50 | 2.86 | 2,577.18 | 2.75 |
| Total fixed cost | 22,374.15 | 22.58 | 19,274.94 | 20.53 |
| Total cost | 99,077.86 | 100 | 93,884.78 | 100 |

**Note:** Figures in parentheses indicate the percentage

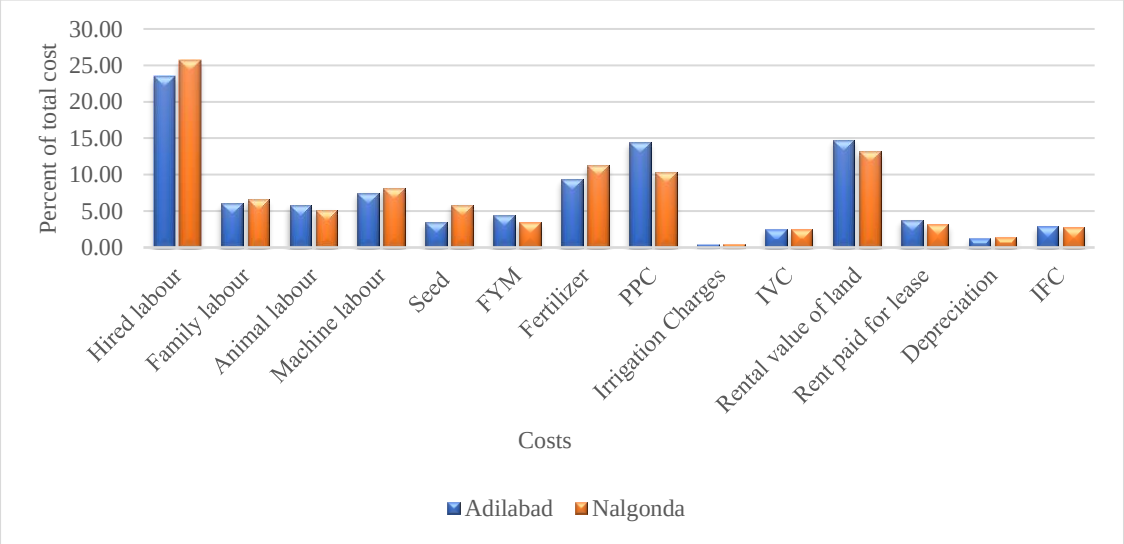


**Figure 1: Costs comparison between Adilabad and Nalgonda districts**

### b. Cost of cultivation in terms of cost concepts (in Rupees per hectare)

Table 4 below presents various cost concepts that were estimated in the study. Cost C2 is the highly comprehensive cost as it encompasses both variable and fixed cost. Cost C3 has been adjusted to reflect the farmers' managerial services.

**Table 4: Cost of cultivation of cotton in terms of cost concept (in Rupees per hectare)**

| Particulars | Adilabad (Rs./ha) | Nalgonda (Rs./ha) |
|---|---|---|
| **Cost A1** | 71,934.80 | 69,832.60 |
| **Cost A2** | 75,639.80 | 72,796.60 |
| **Cost B1** | 78,472.30 | 75,373.78 |
| **Cost B2** | 93,086.46 | 87,723.78 |
| **Cost C1** | 84,463.69 | 81,534.78 |
| **Cost C2** | 99,077.86 | 93,884.78 |
| **Cost C3** | 1,08,985.65 | 1,03,273.30 |

The cost A1 include all variable costs except family labour cost and it also includes fixed costs like depreciation and land revenue. It was Rs. 71,934.80 $ha^{-1}$in Adilabad, and Rs. 69,832.60 $ha^{-1}$ in Nalgonda. Cost A2 includes cost A1 and rent paid for leased land, it was Rs. 75,639.80 $ha^{-1}$ in Adilabad and Rs. 72,796.60 $ha^{-1}$ in Nalgonda. Cost B1 encompasses cost A1 or A2 and interest on fixed assets excluding land, it was worked out at Rs. 78,472.30 $ha^{-1}$ in Adilabad, Rs. 75,373.78 $ha^{-1}$ in Nalgonda.

Cost B2 comprises of rental value of land owned by the farmers along with the cost B1 which was Rs. 93,086.46 $ha^{-1}$ in Adilabad, Rs. 87,723.78 $ha^{-1}$ in Nalgonda. Cost C1 was calculated at Rs. 84,463.69 $ha^{-1}$ in Adilabad and Rs. 81,534.78 $ha^{-1}$ in Nalgonda. Cost C2 is ranged from Rs. 99,077.86 $ha^{-1}$ in Adilabad and Rs. 93,884.78 $ha^{-1}$ in Nalgonda. Finally, cost C3 include managerial input services rendered by the cultivators which is taken as cost C2 plus 10 per cent of cost C2. Which was estimated at Rs. 1,08,985.65 $ha^{-1}$ in Adilabad, Rs. 1,03,273.30 $ha^{-1}$ in Nalgonda. Reddy *et al.* (2020) also confirmed the similar findings with respect to various cost concepts, furthers inferred that all cost concepts were high in large farms.

**c. Returns from cotton cultivation**

The instruments used to estimate the economics of cotton cultivation include yield in quintals, gross returns, net returns, and returns per rupee spent. The cotton returns were calculated and shown in Table 5 below. Farmers harvested 13.13 and 12.99 quintals of cotton per ha in Adilabad and Nalgonda districts respectively

Yield has reduced drastically during the survey period *i.e.*, 2021-2022, because of unseasonal rainfall that occurred in September damaged the cotton crop heavily. Growers reported that they were unable to get even half of the yield of previous year. While the prices were almost doubled compared to previous year. The price hike was more in the Adilabad (Rs. 9,480.00/q) compared to Nalgonda (Rs. 8,653.33/q) due to higher demand for the seed cotton, as many ginning mills are located in Adilabad and there was significant increase in demand for seed cotton from the ginning mills located in neighbouring Maharashtra state. The gross returns (Rs. 1,24,472.40/ha) and net returns (Rs. 25,394.54/ha) were high in Adilabad than gross returns (Rs. 1,12,406.76/ha) and net returns (Rs. 18,521.97/ha) in Nalgonda district.

**Table 5: Returns from cotton cultivation**

| Particulars | Adilabad | Nalgonda |
|---|---|---|
| Total cost (Rs./ha) | 99,077.86 | 93,884.78 |
| Yield (q/ha) | 13.13 | 12.99 |
| Price (Rs./q) | 9,480.00 | 8,653.33 |
| Gross returns (Rs./ha) | 1,24,472.40 | 1,12,406.76 |
| Farm business income (Rs./ha) | 48,832.60 | 39,610.16 |
| Family labour income (Rs./ha) | 31,385.94 | 24,682.98 |
| Net income (Rs./ha) | 25,394.54 | 18,521.97 |
| Farm investment income (Rs./ha) | 42,841.20 | 33,449.16 |
| B:C ratio | 1.26 | 1.20 |

Estimates of various farm income measure were depicted in the table 5. farm business income is the revenue received by the farmers over the cost A2 which was about Rs. 48,832.60 $ha^{-1}$ in Adilabad and Rs. 39,610.16 $ha^{-1}$ in Nalgonda. Income of the family labour is the returns over the cost B2 estimated at Rs. 31,385.94 $ha^{-1}$ in Adilabad and Rs. 24,682.98 $ha^{-1}$ in Nalgonda. Farm investment income was also high in Adilabad (Rs. 42,841.20/ha) compared to Nalgonda. (33,449.16/ha) and the benefit to cost ratio also follow the same trend, which was 1.26 in Adilabad and 1.20 in Nalgonda. The results are in similarity with Sankar and Naidu (2017) arrived at the same conclusion and reported the net profit in the range of Rs. 14,224.60 to Rs. 24,153.49 per hectare for small to large farmers and further estimated overall output to input ratio as 1.34.

## CONCLUSION

In the Adilabad and Nalgonda districts, the estimated cost C2 was Rs. 99,077.86 $ha^{-1}$ and Rs. 93,884.78 $ha^{-1}$ respectively. It is clear that cultivation costs in Adilabad district were greater by Rs. 5193.08 $ha^{-1}$ than those in Nalgonda district. Human labor made up the majority of the cost C2 in both districts. In the Adilabad district, it was noted that spending on chemicals for plant protection was relatively expensive (Rs. 14,326.00/ha). Whereas, expenditure towards fertilizers (Rs. 10,578.19/ha) and seeds (Rs. 5,496.16/ha) were high in Nalgonda districts. Among the fixed cost rental value of land occupied major portion, and it was high in Adilabad (Rs.14,614.17/ha) compared to Nalgonda (Rs. 12,350.00/ha). Because of unseasonal rainfall the yield during the survey period reduced drastically while the prices doubled compared to

previous year's cotton price. The price hike was more in the Adilabad (Rs. 9,480.00/q) compared to Nalgonda (Rs. 8,653.33/q) because many ginning mills located within the district. The net returns (Rs. 25,394.54/ha) were also high in Adilabad than the net returns (Rs. 18,521.97/ha) in Nalgonda district.

It is critical to educate farmers on the best use of resources because the cost of growing cotton is rising while its profitability is declining. Awareness about the appropriate use of plant protection chemicals should be given through extension system. Farmers might be encouraged to practice high density planting strategy to maximize their yield. Mechanization of harvesting/picking can be done in order to reduce the need for human labour.



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