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## Financial feasibility analysis of cotton ginning mills in Karnataka

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### Abstract

The present study was conducted to examine the financial feasibility of cotton ginning mills in Raichur and Yadgir districts. Multistage random sampling technique was used for the selection of sample respondents. From each district, 15 cotton and pressing units are selected. Further, they were categorized into small and large based on their installed capacity and number of the ginning machine. The findings of the study revealed that the average capital investment made for the establishment of cotton ginning mill was Rs.3642.94 lakhs and Rs.3522.29 lakhs in Raichur and Yadgir districts. In case of Raichur district, cost incurred per cotton ginning and pressing unit was Rs. 3642.97 lakhs out of which variable cost and fixed cost constitute 89.97 per cent and 10.09 per cent respectively. Whereas, Net Present Value (NPV), Internal Rate of Return (IRR), payback period years and Benefit: Cost ratio were 955.61 lakhs 43.75 %, 2.58, 3.45 respectively. However, in case of Yadgir district, cost incurred per cotton ginning mills was Rs. 3522.29 lakhs out of which variable cost and fixed cost constitute 89.6 per cent and 10.4 per cent respectively. The NPV was 827.44 lakhs, IRR payback period, and B: C ratio were 39 %, 3 years, 3.17 respectively. It can be concluded that cotton ginning and pressing units in Raichur and Yadgir districts were financially feasible and economically viable, wherein units of Raichur were more economically efficient compared to the Yadgir district.

**Keywords:** Cotton ginning mills, financial feasibility, investment, internal rate of return, net present value

### Introduction

Cotton is the world's most important fiber crop. Cotton plays significant role in the national economy by providing direct and indirect employment and income generation in the agricultural and industrial sectors and it is prime supplier of raw cotton for textile industry, its play a vital role in Indian economy. Around 7.5 million farmers are engages in cotton production, indirectly employs an additional 15-20 million people in activities related to its processing and trade. India is the second largest producer and the second largest consumer of cotton next to China with 23.48 per cent of the World's production. In India cotton crop occupies an area of 123.50 lakh hectares, having 340 lakh bales per hectare (170 kg) production and productivity of 469 kg per hectare (Anonymous, 2021)<sup>[1]</sup>. In India, Gujarat is leading producer and processor of cotton followed by Maharashtra, Telangana, Tamil Nadu and Haryana, Karnataka stands at seventh position in area and production of cotton in country with area under cotton crop was around 7.5 lakh hectares which is 7 per cent of the country's area in 2021-22. The production of the crop is 28 lakh bales (around 4 per cent of the country's production) while productivity is 345 bales per hectare. The main cotton growing districts in Karnataka are Raichur Dharwad, Bellary, and Yadgir (Anonymous, 2021)<sup>[1]</sup>.

Cotton ginning mills are important for value addition to cotton because spinning mills only accept cotton after it has been ginned and pressed. In India, cotton ginning mills are very large and spread over a large area in cotton-growing states. At present, in India there are about 4135 Cotton Ginning mills are operating mainly situated in rural and semi urban areas. Whereas cotton-based industries contribute around 5 per cent to country's gross domestic product (GDP), 14 per cent to industrial production and 11 per cent to total export earnings. According to the secondary data, Raichur and Yadgir districts have the highest number of cotton ginning mills with this view both Raichur and Yadgir district are selected for study with following specific objectives. The present study was undertaken with the specific objective to study the economic financial feasibility of cotton ginning mills in Raichur and Yadgir districts.

**Materials and Methods**

The study was conducted in the Raichur and Yadgir districts of Karnataka state. These two districts were purposively selected based on the highest area under cotton crop in Karnataka and Kalyana Karnataka, respectively and more number of cotton ginning mills were present in these districts. Three taluks from each district were selected based on the highest number of cotton ginning mills in consultation with officials of industrial departments respective districts. The Multistage random sampling technique was adopted in designing sampling frame for the study. In the first stage, Raichur and Yadgir district was selected based on highest number of Cotton ginning mills in Kalyan-Karnataka region. Similarly, In the second stage three taluks were selected based on the potentiality and highest number of Cotton ginning mills in each district. In the third stage, from each district 15 Cotton ginning mills with covering all sizes (Small, large) were selected. In Raichur district among 72 mills 15 mills were selected. For this study out of 15 mills seven small cotton ginning mills and 8 large cotton ginning mills were Separated based upon number of ginning machine and installed capacity. In Yadgir district among 28 mills 15 mills were selected. In order to study out of 15 mills nine small cotton ginning mills and six small cotton ginning mills were separated based upon number of ginning machine and installed capacity.

For evaluating the objectives of the study, the required data were collected through personal interview method with the help of structured and pre tested schedule used for collecting required information. Financial feasibility of cotton ginning mills were assessed by discounted and undiscounted measures as follows

**Net Present Value (NPV)**

This indicates the present value of expected or realized net cash flow or returns of the project over its life period when discounted at the opportunity cost of capital. The opportunity

$$IRR = \left[ \frac{\text{Lower Discount Rate}}{\text{Rate}} \right] + \left[ \frac{\text{Difference between the two discount rates}}{\text{the two discount rates}} \right] \times \left[ \frac{\text{Present worth of the cash flow at the lower discount rate}}{\text{Absolute difference between the present worths of the cash flow at two discount rate}} \right] \dots\dots(6)$$

**iv) Payback Period (PBP)**

It indicates the number of years required to recover the initial investment made in establishment of cotton ginning unit. The method followed is to successively add the net returns from each production year until the investments are completely recovered. Since, the cash flows are not uniform; the payback period was calculated by successively reducing the net cash flows from outstanding investments.

When cash flows are even

$$\text{Payback Period} = \frac{I}{E} \dots\dots (7)$$

Where

P = Payback period in years

I = Initial investment in rupees

E = Annual net cash revenue in rupees

When cash inflows are uneven, we need to calculate the cumulative net cash flow for each and then then we use following formula for payback period.

$$\text{Payback Period} = A + \frac{B}{C} \dots (8)$$

cost of capital considered in this study was 14.00 per cent per annum. NPV of the project is estimated using the following equation.

$$NPV = \frac{P_1}{(1+i)^1} + \frac{P_2}{(1+i)^2} + \dots + \frac{P_n}{(1+i)^n} - C \dots (4)$$

Where

P<sub>1</sub> = Net cash flow in the initial year

I = Discount rate @ 14%

T = Time period

C = Initial investment at t=0

**ii) Benefit- Cost Ratio (BCR)**

The benefit cost ratio worked out by discounting the returns and costs during the life period of the Cotton ginning unit establishment at a discount rate of 14.00 per cent per annum. The following formula depicts the estimation of benefit cost ratio.

$$B-C \text{ ratio} = \frac{\sum_{t=1}^n \frac{B_t}{(1+r)^t}}{\sum_{t=1}^n \frac{C_t}{(1+r)^t}} \dots\dots (5)$$

Where,

B<sub>t</sub> = Discounted benefit @ 14%

C<sub>t</sub> = Discounted Cost @ 14%

n = Number of years

r = Discount rate

**iii) Internal Rate of Return (IRR)**

It is the discount rate which makes the net present value of the project benefits equal to zero. It is usually determined by trial-and-error method. In this study also IRR was computed by trial-and-error method. The amortized discount rates are used to calculate IRR by using following formula given below.

Where,

A= Last period with a negative cumulative cash flow

B= Absolute value of cumulative cash flow at the end of the period A

C = Total cash flow during the period after A

**Results and Discussion**

The capital investment made for the establishment of cotton ginning mills was presented in Table 1. Cotton ginning mills were categorized into small and large based on the installed capacity and number of ginning machines. It is evident from table 1 that a total investment of Rs.4277.47 lakhs was needed for establishing one large mill in the Raichur district and in the case of small mills the investment of Rs.3008.41 lakhs was required to establish a small mill. However, the overall capital investment was found to be Rs.3642.94 lakhs in the Raichur district. Similarly, in the case of the Yadgir district, the overall Capital investment was Rs.3522.29 lakhs, but in terms of small and large mills, the investment was Rs.2836.52 lakhs and Rs.4208.08 lakhs per mill respectively.

**Table 1:** Capital investment pattern in cotton ginning mills of Raichur and Yadgir districts.  
(Rs in lakhs per mill)

SI. No.	Particulars	Raichur district			Yadgir district		
		Small	Large	Overall	Small	Large	Overall
		(n=8)	(n=7)	(n=15)	(n=9)	(n=6)	(n=15)
1	Fixed capital	312.76 (10.39)	422.22 (9.87)	367.49 (10.09)	321.20 (11.3)	417.65 (9.82)	369.42 (10.48)
2	Working Capital	2695.65 (89.61)	3855.25 (90.13)	3275.45 (89.91)	2515.32 (88.7)	3790.43 (90.18)	3152.87 (89.52)
	Total	3008.41 (100)	4277.47 (100)	3642.94 (100)	2836.52 (100)	4208.08 n(100)	3522.29 (100)

Note: Figures in parenthesis indicate per cent to the total

The finding also conveys that the proportion of Working capital (89.91 %) was more than fixed capital (10.09 %) in total capital investment in cotton ginning mills of the Raichur district. Similarly, in the case of Yadgir, working capital (89.52 %) is more than fixed capital (10.48 %) in total capital investment. it directly indicates that the cotton ginning mills

established in the Raichur district have huge capital investment because of the use of modern technologies such as automatic feeders, high-efficiency machines, etc to handle the larger quantity of raw cotton material. Similar results were reported by Radhika and Kumari (2015) [2].

**Table 2:** Fixed capital investment pattern in cotton ginning mills of Raichur and Yadgir districts  
(Rs in lakh per mill)

Si. No	Particulars	Raichur district			Yadgir district		
		Small	Large	Overall	Small	Large	Overall
		(n=8)	(n=7)	(n=15)	(n=9)	(n=6)	(n=15)
1	Land	42.50 (13.58)	81.50 (19.30)	62.00 (16.64)	40.10 (12.48)	80.50 (19.27)	60.30 (16.32)
2	Buildings	29.71 (9.50)	35.20 (8.39)	33.45 (8.96)	28.50 (8.87)	36.28 (8.68)	32.39 (8.76)
3	Machinery and equipment	236.14 (75.50)	300.43 (71.12)	272.28 (73.13)	247.74 (77.13)	295.02 (70.63)	271.38 (73.48)
4	Furniture and other fixture	2.09 (0.66)	2.73 (0.64)	2.41 (0.64)	2.10 (0.65)	2.81 (0.67)	2.45 (0.66)
5	other infrastructure facilities	2.31 (0.74)	2.35 (0.55)	2.33 (0.63)	2.75 (0.87)	3.03 (0.75)	2.89 (0.78)
	Total	312.75 (100)	422.21 (100)	367.47 (100)	321.19 (100)	417.64 (100)	369.41 (100)

The findings of fixed capital investment patterns in cotton ginning mills include land, building, machinery and equipment, furniture, and other infrastructure. It is presented in seen from table 2. A fixed capital investment of Rs.422.21 lakhs was the need for establishing a large mill and Rs.312.75 lakhs for small mills in the Raichur districts. The investment in machinery and equipment accounted for 71.12 per cent in large mills and 75.50 per cent in small mills of Raichur district. Further, the investment on land was 19.30 per cent in large and 13.58 per cent in the case of small mills, and investment on buildings accounted for 8.39 per cent and 9.50 per cent in large and small mills, respectively. However, investment on furniture and other infrastructure accounted for less than one per cent of the total fixed capital in the Raichur district.

In the case of Yadgir district, the capital investment on machinery and equipment accounted for (77.13%) in small mills and (70.63 %) in large mills to the total fixed capital investment. The second highest investment item was land, which accounted for 19.27 per cent and 12.48 per cent in the case of large and small mills respectively. The third major item for investment was made on building accounting for 8.68 in large and 8.87 in small mills. However, investment on furniture and other infrastructure accounted for less than one per cent of the total fixed capital in the Yadgir district.

The major investment items are Machinery and equipment,

and land and building were found to have a higher proportion of investment than other fixed capital investment. Findings are similar with Suvagiya and Kunt (2020) [4] and Radhika and Kumari (2015) [2]. This indicated that the requirement of capital investment increases with an increase in size of mills due to increase in the investment on machinery, land, and buildings in the one hand and also an increase in working capital investment on the other hand.

#### Finical feasibility analysis

The economic feasibility of investing in cotton ginning units was determined by analysing the following economic parameters: Net Present Value (NPV), Benefit Cost Ratio (BCR), Internal Rate of Return (IRR), and Pay Back Period (PBP). These were calculated by using conventional methods, taking into account the economic life of a cotton ginning mills. The investment made in the establishment of cotton ginning units was made gradually over a 10-year period. As a result, it was assumed that the cotton ginning mills would continue operating for the next 10 years. Financial analysis tools were also performed to determine the economic viability of cotton ginning mills of Raichur and Yadgir districts. The financial analysis was carried out separately for small and large cotton ginning mills and for all together. Results obtained from the various parameters of financial feasibility analysis are presented in table.3

**Table 3:** Evaluation of investment in cotton ginning mills of Raichur and Yadgir districts.  
(Rs in lakhs)

SI NO.	Particulars	Raichur (Cotton ginning mills)			Yadgir (Cotton ginning mills)		
		Small (n=8)	Large (n=7)	Overall (n=15)	Small (n=9)	Large (n=6)	Overall (n=15)
1	Net present value (Rs in lakhs)	674.21	1238.39	955.61	564.24	1090.65	827.44
2	Benefit - cost ratio (BCR) @ 14%	3.17	3.63	3.45	2.94	3.41	3.17
3	Internal rate of return (IRR) @ 14 %	38.51	48.00	43.75	32.00	46.00	39.00
4	Payback period (years)	2.80	2.10	2.58	3.10	2.90	3.00

As evident from table 3 that, Net present value of the Raichur district was Rs.955.61 lakhs found to be higher than the Yadgir district. It was due to higher cost and return. While the Benefit-cost ratio was also higher in the Raichur district 3.45 whereas in the case of the Yadgir district was found to be 3.17. The magnitude of the ratio depends upon the size of mills and the cost of processing. Hence Raichur district has more Benefit-cost ratio. The Internal Rate of Return for cotton ginning mills of the Raichur district was found to be 43.75 per cent. Whereas, it was 39.00 per cent in the case of cotton ginning mills of Yadgir district. It was found to be more than the prevailing bank rate 14 per cent. An internal rate of return was found to be higher in Raichur district compared to Yadgir district. This might be due to high turnover ratio in mills of Raichur district. The payback period of cotton ginning mills in the Yadgir district was found to be more than Raichur district. Mills in the Yadgir district took a higher time to recover the initial investment because of low annual net return from processing. Thus, all criteria of financial feasibility analysis of investment state that cotton ginning mills of Raichur district earn more profit than the Yadgir district. It concludes that establishing mills in the Raichur district was a more profitable venture. This was similar to the observation made by Shelke *et al.* (2009)<sup>[3]</sup>, Radhika and Kumari (2015)<sup>[2]</sup>.

### Conclusion

It is revealed from the study that cotton ginning is a profitable venture, and it requires the large amount of initial investment. From the analyses its concludes that ratio of working capital is higher than the fixed capital and various financial analysis tools like NPV, B:C ratio, IRR, Payback period showing the positive responses from this its cleared that investment in cotton ginning mills is profitable. Cotton ginning mills is a capital-intensive industry, the interest rate was too high, hence there is need to provide sufficient capital at a lower interest rate for growth and development of agro processing industries in rural areas.

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