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Short Communication

An Economic Analysis on Production of G9 Banana in Andhra Pradesh, India

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***Key words*:** Grand Naine banana, Cost and returns, Net returns per rupee of investment

Banana (*Musa paradisica* L.) is a significant domesticated herbaceous food crop in the world. It is the oldest and commonest fruit known to humankind. Andhra Pradesh is the fourth largest banana-producing state in the country, with nearly 10 per cent of yield from the state. Banana is cultivated to the extent of 88,960 ha in the Andhra Pradesh state. Among the banana cultivating districts of Andhra Pradesh, Y.S.R. Kadapa district has the highest area under the banana, followed by West Godavari and East Godavari, Anantapur districts. The Grand Naine variety of bananas cultivating in Andhra Pradesh is in great demand at abroad and is very popular in the state. In Andhra Pradesh, the Y.S.R. Kadapa district is well known for banana plantations, especially the G9 variety. In the district, Lingala, Vemula, Pulivendula, and Rajampeta mandals cultivate a variety of bananas. Under Pulivendula constituency, G9 banana farming is done through tissue culture, and fruits are exported to Arab countries. The orchards are spread over 10,000 acres. The normal bananas can be stored for 6-7 days only, but the G9 variety of bananas grown in Pulivendula areas have a shelf life between 12-14 days, which makes them most preferred for exporting to other countries. By considering its importance, the study aims to analyze the production of Grand Naine banana in Andhra Pradesh with the following specific objectives:

1. To study the varieties preferred by sample banana farmers and
2. To estimate the cost and returns of banana cultivation in the study area.

The Andhra Pradesh state of India has been selected for the study as it is one of the major banana-cultivating states. Among the 13 districts of Andhra Pradesh, Y.S.R. Kadapa district was selected purposively, because it ranks first in area and production of banana accounting for 16,731 ha and 8,67,663 MT, respectively. The area under cultivation has been increasing consistently because of good demand in the district. With regard to the selection of Mandals, Lingala and Vemula mandals were purposively selected since these Mandals occupied first and second place in the area, and production of banana in the Y.S.R. Kadapa district. From the selected mandals of Y.S.R. Kadapa district, 320 farmers were identified randomly as sample farmers based on the probability proportionate method by using random number tables.

(i) *Descriptive statistics*

i. *Simple tabular analysis*

The data were analyzed and interpreted in tabular form.

ii. *Averages and percentages*

The analyzed data were expressed in averages and percentages for a better understanding.

(ii) *Cost return analysis*

Cost-return analysis was used to study the economics of banana cultivation. The total costs were divided into two broad categories

A. Variable costs
B. Fixed costs

Cost A1

It includes all actual expenses in cash and kind incurred during production by the farmer.

i. Value of hired human labour
ii. Value of machine labour
iii. Value of tissue culture plants
iv. Value of manure
v. Value of fertilizers and plant protection chemicals
vi. Depreciation of farm building and implements
vii. Irrigation charges
viii. Transportation charges
ix. Interest on working capital
x. Miscellaneous expenses

Cost A2 = Cost A1 + rent paid for leased in land
Cost B1 = Cost A2 + interest on value of owned capital assets (excluding land)

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Cost B2 = Cost B1 + rental value of owned land
Cost C1 = Cost B1 + imputed value of family labour
Cost C2 = Cost B2 + imputed value of family labour
Cost C3 = Cost C2 × 1.10 (10% of cost C2 added to C3)

The cost of C3 is added in order to provide an allowance for managerial functions undertaken by the farmer.

$$\text{Cost of production} = \frac{\text{Cost } C_3 - \text{Value of by product}}{\text{Yield / Acre}}$$

Varieties preferred by sample farmers in the study area

The preference for growing a particular variety as perceived by the farmers was analyzed and the results are presented in (Table 1, Fig 1). It could be observed from (Table 1) that 87.18 per cent of the total farmers preferred to grow the Grand Naine variety, followed by 7.81 per cent of farmers preferred to grow Sugandhalu variety and the remaining 13.33 per cent of farmers preferred to grow other varieties such as Amruthapani, Karpoora Chekkerkeli and Red banana. It is inferred that the majority of the sample farmers preferred the Grand Naine variety, this may be due to the high yield and high market price for this variety compared to other varieties.

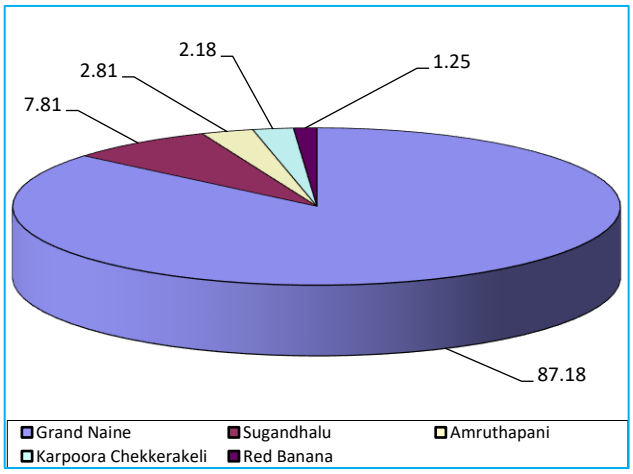

Fig 1 Varieties preferred by sample farmers

Cost of cultivation of banana in the study area

The details of the cost of banana cultivation and the share of different costs and returns per acre for average sample G9 banana farmers are given in (Table 1). The primary cost incurred on the purchase of tissue culture plants with the amount of Rs. 14,400 per acre. The farmers in the study area purchase plantlets with different prices, ranging from Rs. 12 to 17 per plantlet, varying across the companies in the study area selected in the district. On the National Horticultural Mission program report, farmers are provided with the plantlets subsidy on average sample farmers. The machine labour and two men were used for land preparation for 4 hours incurring a cost of Rs.700 per hour and Rs. 300 per labour, which costs Rs. 600 per acre. For digging ridges and furrows, 5 men labours are used at the wage rate of Rs. 300 per labour, which was estimated at Rs. 1500 per acre.

Farmyard manure was used for banana production. 4 tonnes FYM was applied for one acre acquiring Rs. 1000 per tonne, which was estimated for Rs. 4000. For the application of manure, 2 men labours were used at the wage rate of Rs. 300 per labour, which was accounted for at Rs. 600 per acre. The main inorganic fertilizers used for the production of bananas were complex (25 kg), DAP (25 kg), urea (100 kg), MKP (25 kg), CAN (50 kg), SOP (25 kg), which costs Rs. 80/kg, Rs. 92/kg, Rs. 4.6/kg, Rs. 160/kg, Rs.23/kg and Rs. 36/kg, respectively, and they accounted for Rs. 15,820 per acre. For the application of fertilizers, 3 men labours were engaged at the wage rate of Rs. 300 per labour, which was estimated at Rs. 900 per acre. The total cost of fertilizer applied was considered at Rs. 15,820.

The plant protection chemicals used for banana production were Monocrotophos, and neem oil was sprayed at the rate of 250 ml per acre accounted for Rs. 1300 per acre. For the application, 2 men labours were engaged at the wage rate of Rs. 300 per labour, which was estimated at Rs. 600 per acre. Drip irrigation is the most preferred common method of irrigation adopted by the farmers in the study area. In banana cultivation, weeding was one of the most important intercultural operations. Weeding was done 2 times; each time 5 women labours were engaged at the rate of Rs. 200 per labour, which was accounted at Rs. 2,000 per acre. At the time of harvesting, 6 skilled men labours were used at the wage of Rs. 500 per labour, and 3 harvests were made per year. The total estimated cost for harvesting was Rs. 12,000 per acre. The cost of other miscellaneous expenses was Rs. 2,000 per acre.

The total operations cost accounted for was Rs. 58,120 per acre. Interest on working capital was supposed at a rate of 10 per cent and was worked out to Rs. 5,812. Depreciation on fixed assets was estimated at Rs. 2250 per acre. The rent paid for leased in-land was excluded, as all the sample farmers in the study area done the cultivation of banana in their own land. The land's rental value was estimated as the one-third value of output and accounted for Rs. 23,794. The imputed value of family labour was Rs. 2000 per year.

The total cost of cultivation of Grand Naine banana was calculated as Rs. 1,06,893 per acre. The estimated average yield of banana per acre was 28 tonnes, and the output price was Rs. 17,000 per tonne, i.e., Rs. 17 per kg. The gross return is estimated at Rs. 4,76,000 and whereas the net return is Rs. 3,69,107. The average cost of production per kg of Grand Naine banana was derived at Rs. 3.81 per kg, and the net return per rupee was 3.45 in the study area.

Table 1 Cost of cultivation of Grand Naine banana

Particulars	Quantity with units	Cost (Rs/ac)
Tissue culture plants	Rs. 12/plant × 1200 plants	14,400 (13.47)
Land preparation		
a. Human labour	2 labours × Rs. 300/labour	2,800 (3.18)
b. Tractor labour	4 hours × Rs. 700/hour	600
Digging and furrows	5 labours × Rs. 300/labour	1,500 (1.40)
Organic manure	FYM – 4 tonnes × Rs. 1000/ tonne × 2 labour × Rs. 300/labour	4,600 (4.30)
Fertilizers	Complex – 25 kg × Rs. 80/kg Super phosphate – 150 kg × Rs. 7.4/kg Mono Ammonium phosphate – 25 kg × Rs. 92/kg Urea – 100 kg × Rs. 4.6/kg Multi K – 25 kg × Rs. 160/kg	15,820 (14.79)

	Calcium Nitrate – 50 kg × Rs. 23/kg MKP – 25 kg × Rs. 120/kg SOP – 25 kg × Rs. 36/kg	
Weeding	2 times × 5 women labours × Rs. 200/labour	2,000 (1.87)
Irrigation	--	500 (0.46)
Plant protection	Monocrotophos – Rs. 500 @ 500 ml M-45 – Rs. 400 + neem oil – Rs. 400 @ 250 ml 2 labours × Rs. 300/labour	1,900 (1.77)
Harvesting	4 harvests × 6 labours × Rs. 500/labour	12,000 (1.22)
Other miscellaneous charges	--	2,000 (1.87)
Total	--	58,120 (54.45)
Interest on working capital @ 10%	--	5,812 (5.43)
Depreciation on fixed capital	--	2,250 (2.10)
Total cost A_1	--	66,182
Rent paid for leased –inland	--	Nil
Total cost A_2	Total cost A_1 + Rent paid for leased –inland	66,182
Interest on owned fixed capital	--	5,200 (4.86)
Total cost B_1	Cost A_2 + Interest on owned fixed assets	2739.12 (2.56)
Rental value of owned land	1/3 value of output	23,794 (22.25)
Total Cost B_2	Cost B_1 + Rental value of owned land	95,176 (89.03)
Imputed value of family labour	--	2,000 (1.87)
Total Cost C_1	--	--
Total Cost C_2	Cost B_2 + Imputed value of family labour	97,176
Total Cost C_3	Cost C_2 + 1.10 (10% of Cost C_2 added to Cost C_2)	1,06,893
Yield (tonne)	--	28,000
Price (Rs/tonne)	--	17,000
Gross returns	--	4,76,000
Net returns	--	3,69,107
Net return per rupee	--	3.45
Cost of production (Rs/kg)	--	3.81

Figure in the parenthesis indicate percentage to the total

SUMMARY

Banana is the world's favourite fruit, and the fifth-largest horticultural commodity traded globally. The famous Grand Naine banana variety is cultivated extensively in the Y.S.R Kadapa district of Andhra Pradesh state. The overall objective is to study the production of Grand Naine banana in Andhra Pradesh. The specific objectives are to study the varieties preferred by sample farmers in the study area and to estimate the cost and returns of banana cultivation in the study area. The Andhra Pradesh state has been selected for the study as the universe. With regard to the selection of the district as the first stage, the Mandals in the district as the second stage unit, and the villages in the Mandals as the third stage unit. 320 sample farmers were selected randomly based on the probability proportionate method by using random number tables. The results of the study revealed that 87 per cent of the sample farmers preferred to grow the Grand Naine variety due to the high yield and high market price for this variety compared to other varieties. The cost of production per kg of banana was Rs. 3.81/- and net returns per rupee of investment was Rs. 3.45. It showed that cultivation of G9 banana is a highly profitable venture in the study area and the study suggested that uniform prices for the plantlets may be provided through Government interventions. The farmers in the study area purchased plantlets with wide price differences and the study suggested that uniform prices for the plantlets may be provided through Government interventions.

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