



Returns on Mango Orchard and Economic Feasibility Tests of Mango Orchard in Chittoor District of Andhra Pradesh

KEYWORDS

Mango orchards, Internal rate of return

Dr. Tripuraneni Jaggaiah

Associate Professor, Koshys Institute of Management Studies, Bangalore

ABSTRACT *Mango is the most significant tropical and subtropical fruits of the world, is called as the king of fruits on account of its nutritive value, taste, attractive fragrance and health promoting qualities. Mango is well adapted to tropical and sub tropical climates. The ideal temperature for mango ranges from 24°C to 30°C during the growing season, along with high humidity. A rainfall ranging from 890 to 1,015 mm in a year is considered to be ideal for growing mango. This paper made an attempt to review the status of the costs and returns had been discounted at 12, 15 and 20 per cent to estimate the present worth of future returns. The net present value, benefit cost ratio; profitability index and internal rate of return are calculated and presented.*

Introduction

Mango is the most significant tropical and subtropical fruits of the world, is called as the king of fruits on account of its nutritive value, taste, attractive fragrance and health promoting qualities. Mango is well adapted to tropical and sub tropical climates. The ideal temperature for mango ranges from 24°C to 30°C during the growing season, along with high humidity. A rainfall ranging from 890 to 1,015 mm in a year is considered to be ideal for growing mango. The fruit is cultivated in the largest area i.e. 2500 thousand hectares and the production is around 18002 thousand tonnes produced in India during 2013-14, contributing 40.48% of the total world production of mango. Other major mango producing countries include China, Thailand, Mexico, Pakistan, Philippines, Indonesia, Brazil, Nigeria and Egypt.

Need for the Study and Objectives

Besides being a rich source of nutrients, cultivation of mangoes brings higher income to the farmers. It is possible to have value addition through processing, which in turn, offers vast opportunities for employment and income generation. The processing of mango fresh fruits into pulp is an important agribusiness in Chittoor district and hence the Agri-export zone is located in this district for exporting mango pulp and fresh vegetables. So far very few research studies have been attempted to study the economic aspects of mango production in Andhra Pradesh in general and Chittoor district in particular. Hence, the present study was undertaken with the following objectives:

1. To analyze costs and returns of the mango orchards.
2. To estimate the net present value and economic feasibility of the investment on mango orchards.

SAMPLING DESIGN

Multistage stratified random sampling technique was employed for the selection of the district, mandals, villages and farmer respondents. Chittoor district in Andhra Pradesh was purposively selected for the study based on maximum area in the state under mango. In this district mango is grown over an area of 53,200 hectares. In Chittoor district, all the mandals having orchards were arranged in the descending order of the area under mango and six mandals viz., Bangarupalem, Thavanampalli, Puttur, Karvetinagar, Vadamalapeta and Piler which have largest area under mango were selected purposively for the pre-

sent study. Two villages from each selected mandal were chosen purposively using the above said procedure making the total number of selected villages to 12.

The list of farmers growing mango in the selected villages was obtained from their respective village records. From the list of mango growers, a total of 80 farmers were randomly selected for studying the production aspect of mangoes.

1. RETURNS ON MANGO ORCHARD**Costs and Return from intercrops**

1.1. During the first year of mango orchard as the plants are small, in order to allow them to establish well no intercrops were taken. From 2nd to 4th year intercrops were taken by farmers. Groundnut, green gram, horse gram and cowpea were grown as intercrops. The per hectare cost of cultivation of intercrops, gross and net income were given in Table 1.

Table 1: Costs and returns from intercrops per hectare (Value in Rs)

Particulars	2 nd year (in Rs)	3 rd year (in Rs)	4 th year (in Rs)
1. Total Costs	25599	25367.24	24074.95
2. Gross income	36400	31200	28600
3. Net income	10801	5832.76	4525.05

1.2. Returns on mango orchard from 5th to 10th year

Mango grafts commence bearing from 5th year onwards. Earlier, stray fruits may appear on the tree but it is advisable not to allow them to mature. Good yields are obtained from 7th year onwards. Flower bud initiation take place after cessation of rains in October and November and flowering occurs during dry months (December to February). Yields are obtained on commercial scale from 15th year and may continue till 40th year.

Per hectare yields on mango orchard from 5th to 10 year are presented in Table 2.

Table 2: Returns on mango orchard per hectare (5th to 10th year)
(Value in Rs)

Particulars	5	6	7	8	9	10
1. Yield (tonnes)	1.82	2.78	3.76	5.72	5.81	7.24
2. Gross returns	21840	33360	45120	68540	69720	86880
3. Total costs	32456.24	34679.6	35089	35459	36441.1	37164.1
4. Net returns	-10616.2	-1319.56	10031	33182	33278.9	49715.9

During 5th year a hectare of mango orchard yielded 1.82 tonnes. As the age of the orchards increased, the yield also increased to 7.24 tonnes during 10th year.

The gross return from the orchard ranged from Rs 21,840 during 5th year to Rs 86,880 in 10th year. The net return ranged from Rs -10,616.24 to Rs 49,715.91.

1.3. Returns on mango orchard from 11th to 20th year

The data on yields, gross and net returns on mango orchards from 11th to 20th year are yield per hectare increased from 7.73 tonnes in 11th year to 15.31 tonnes in 20th year. The gross returns obtained from orchard ranged from Rs 92,760 to Rs 1, 83,720. Per hectare net return ranged from Rs. 54,475.01 to Rs. 1, 40,381.72.

1.4. Returns on mango orchard from 21st to 40th year

The year wise total yields, gross and net returns per hectare of mango orchard from 21st to 40th year are about 14.36 tonnes during 21st year and it increased to 20.16 tonnes in 30th year and then declined to 15.14 tonnes by 40th year. The per hectare gross and net return were also on increasing trend up to 30th year.

The return showed a gradual decline after 30th year. However, the substantial but gradual increase in returns from 5th year up to 30th year could be attributed to the fact that production increased with increase in age, then stabilized and decreased thereafter.

1. Economic Feasibility Tests of Mango Orchard

The costs and returns are not the perfect measure to assess the profitability from investment from mango orchard. These costs and returns are not comparable with the returns from field crops that are grown in the area. In the case of annual crops, the returns from investment can be obtained within a year which is not possible in the case of mango, being a perennial crop. This shows the need to estimate the returns from discounting future returns. Hence, it was felt necessary to estimate the net present value of future returns. In the present study the costs and returns had been discounted at 12, 15 and 20 per cent to estimate the present worth of future returns. The net present value, benefit cost ratio; profitability index and internal rate of return are calculated and presented in Table 3.

Table 3: Estimate of economic viability of mango orchard

Sl. No	Particulars	12%	15%	20%
1	Net present value (Rs)	2,64,105.42	1,31,992.95	33,043.89
2	Benefit-cost ratio	1.77	1.48	1.15
3	Profitability index	2.93	1.46	0.3669
4	IRR (%)	23.17	-	-

It was observed from the table that the net present value was as high as Rs.2, 64,105.42 at 12 per cent and Rs.33, 043.89 at 20 per cent discount rates. The high positive NPV even at higher discount rates indicated the soundness of the investment in mango cultivation.

2.2. Benefit-Cost Ratio

The benefit cost ratios for mango orchard worked out to 1.77 at 12 per cent discount rate and 1.15 at 20 per cent discount rate. These values proved that the investment on mango cultivation was economically feasible.

2.3 Profitability index

The estimated profitability index of mango orchard was 2.93 at 12 per cent and 0.3669 at 20 per cent discount rates respectively.

2.4. Internal Rate of Return

The IRR in the mango cultivation was found to be 23.17 per cent indicating the favourable nature of returns and was also higher than the borrowed rate of interest i.e., 15 per cent.

Conclusion

The per hectare gross returns on mango orchard from 2nd to 4th year, 5th to 10th year, 11th to 20th year and 21st to 40th year were Rs. 96,200, Rs. 3,25,560, Rs. 13,80,840 and Rs. 41,14,560. The respective net returns in the above said age groups were Rs 21,158.81, Rs. 1, 14,272.1, Rs. 9, 65,919.71 and Rs. 31, 97,874.21.

To study the economic feasibility of mango orchard net present value, benefit cost ratio, internal rate of return and profitability index were calculated at 12, 15 and 20 percent discount rates. Even at a higher discount rate of 20 per cent, the calculated values of net present values, B-C ratio and profitability index were Rs. 33,043.89, 1.15 and 0.3669 respectively. Internal rate of return was calculated at 23.17 per cent, higher than the borrowed rate of interest i.e. 15 per cent.

Major Findings

The following conclusions emerged from the present study

1. Most of the mango growers were large farmers whose involvement in farm operations was less.
2. In human labour utilization major share was taken by harvesting followed by watch and ward.
3. Most of the recommended package of practices was not adopted by the mango growers in the study area.
4. The discounted techniques used to know the feasibility of the mango project even at a higher discount rate of 20 per cent indicated the feasibility of investment in mango orchard.

Suggestions

1. It is clear from the study that the farmers are not aware of the importance of applying recommended doses of manures and fertilizers. Hence the extension agencies have a very important role to play in educating the farmers to adopt recommended package of practices.
2. Government should establish more number of cold storage units so that post harvest losses can be minimized.

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