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**Shelke RT**

Assistant Professor, Department of Agril. Entomology, Don Bosco College of Agriculture Sulcorna Quepem, Goa, India

**Kolambkar RA**

Assistant Professor, Department of Agricultural Economics & Statistics, Don Bosco College of Agriculture Sulcorna Quepem, Goa, India

## Economic analysis of beekeeping (*Apis cerana indica*) in South-Goa district of Goa state

**Shelke RT and Kolambkar RA**

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**Abstract**

The aim of this research is to analyze technical and economic aspects of apiary set up at Don Bosco College of agriculture Sulcorna, Goa for the year 2020. The Economics of apiary was given under cost heading which includes three sub groups mainly recurring cost, non-recurring costs and Net expenses. Net expenses incurred to Rs. 22595. The provincial difference in costs and returns of beekeeping enterprise were determined to get net profit, which amounts to Rs. 27605. B:C ratio was 2.22 which depicts investment of Re. 1 tends to give profit of Rs. 1.22 from honey and wax excluding pollination benefit, representing apiculture business is profitable in South-Goa district of Goa state.

**Keywords:** Beekeeping, economics, net profit, benefit cost ratio

**Introduction**

In India, Honey bees viz., *Apis cerana indica*, *Apis mellifera*, *Apis dorsata*, *Apis florea* are commonly known for their pollinating services and honey production. The Indian honey bee, *Apis cerana indica* Fab. is used in South India for commercial beekeeping and honey production.

The talukas of South-Goa district fall under western ghat where the commercial beekeeping is practiced by farmer. Due to the diversified vegetation, *Apis cerana indica* performs better in South-Goa district of Goa. Don Bosco college of Agriculture Sulcorna, Quepem Goa is situated in the western ghat. By considering need and adaptability of beekeeping project in the region the present study on "Economic Analysis of Beekeeping (*Apis cerana indica*) in South-Goa District of Goa State" was undertaken. Similarly, findings help to study comparative analysis of recurring and non-recurring cost.

**Material and Methods**

This research aims to analyze apiary of Don Bosco College of Agriculture Sulcorna, Quepem of South – Goa district of Goa State. Study includes importance of honey production in Goa state. Similarly results of technical and economic aspects of honey production were given. A total of 50 comb hives were surveyed. These honey comb hives surveyed for the year, 2020 (Period between January, 2020 to May, 2020). By considering number of colonies and individual analysis group averages were computed and research study was conducted.

Total gross income of bee keeping enterprise, production costs, unit cost of honey production, net return, B:C ratio were calculated through tabular analysis. The cost items of honey production were classified into variable and fixed costs. The variable costs associated with honey production were all inputs that directly related to the production of honey and indirect items such as labour for supervision and transport, water, marketing and other miscellaneous costs. Fixed costs included all the cost on fixed assests. Interest on fixed capital calculated by charging a rate of 10% of total cost of fixed assests. Depreciation was estimated using the straight-line method and the depreciation rate for beekeeping equipment. In the light of findings, it was found that honey production is advantageous according to both absolute profit and relative profit. Fixed costs plus variable costs equal to total production costs.

In the study, total production costs were subtracted from total gross revenue to calculate net return and the unit cost of extracted honey is obtained by dividing the total production costs of extracted honey by the number of units produced. Profit status of beekeeping enterprise was estimated through B: C ratio analysis.

**Corresponding Author:****Shelke RT**

Assistant Professor, Department of Agril. Entomology, Don Bosco College of Agriculture Sulcorna Quepem, Goa, India

## Result and Discussion

### Table 1A & Table 1B: Estimated non – recurring and recurring cost of scientific apiary holding 10 colonies

In the Table 1A & 1B detailed regarding non – recurring and recurring costs on apiary was given. Non – recurring cost incurred on the project was Rs. 85100. In non-recurring expenses highest share was on bee hives amounting Rs. 40000 which was 47 per cent of the total cost. Other cost items included were Nucleus honey bee colonies, honey extractor, smoker, sealing machine etc. Recurring or running cost on the project incurred to be Rs. 7050. In which labour cost contributed to Rs. 1800 which is 25.53 per cent of total running cost. Total of non-recurring and recurring cost was Rs. 92150 which indicates that non – recurring cost on apiary was more as compare to recurring cost.

**Table 1A: Non-Recurring Cost**

Sr. No.	Particulars	Quantity (No./kg)	Rate (Rs.)	Amount (Rs.)	Percentage share
1.	Bee hive with super	10	4000/hive	40000	47.00
2.	Nucleus honeybee colonies (on four bee frames each)	10	2000/colony	20000	23.50
3.	Honey extractor (4 frames),	1	5000/set	5000	5.88
4.	Smoker, bee veil, bee gloves, hive tool, uncapping knife	1set	1100/set	1100	1.30
5.	Ant pans & stands	1 set	7000/set	7000	8.22
6.	Sealing machine	1	12000	12000	14.10
			Total	85100	100.00

**Table 1B: Recurring Cost**

Sr. No.	Particulars	Quantity (No./kg)	Rate (Rs.)	Amount (Rs.)	Percentage share
1.	Comb foundation sheets	50	60/CF	3,000	42.55
2.	Sugar for dearth period feeding	5kg	50kg	250	3.55
3.	Labour	300	6 days	1800	25.53
4.	Miscellaneous	10 colonies	200/colony	2000	28.37
			Total	7050	100.00
Total Cost=Recurring + Non-recurring cost = Rs.92150					

**Table 2: Net Expenses**

Sr.no.	Particulars	Amount	Percentage share
1.	Interest on non-recurring cost @10%	8510	37.66
2.	Recurring cost	7050	31.20
3.	Interest on recurring cost (except labour) for 5 months @ 10%	525	2.32
4.	Depreciation on permanent articles @ 10% (except on bee colonies)	6510	28.81
	Total annual Expenses	22595	100.00

**Table 3: Gross Monetary Income**

Sr.no.	Particulars	Average yield/colony	Total quantity Produced	Rate (Rs.)	Amount (Rs.)
1.	Honey Production	50kg	50kg	1000/kg	50000
2.	Bee wax	2% of the honey produced	1kg	200/kg	200
			Total		50200

- Net Profit = Rs. 50200 - Rs. 22595 = Rs. 27605
- Profit /Colony = Rs. 27605/10 = Rs. 2760.50
- B: C ratio: 2.22

## Conclusion

Honey production plays a very important role as a source of increasing rural income in sustainable development. As per study total cost incurred was Rs. 92150. Net expenses by considering interest on non – recurring cost, recurring cost and depreciation on permanent articles amounted to Rs. 22595. Beekeeping enterprise faced many problems as quality, variety, mix harvest, sugar and residue. Despite of the problems honey production was found profitable business in this study. Gross return was Rs. 50200 and net profit was Rs. 27605 per10 colony. B:C ratio comes out to be 2.22 which

## Table 2: Net expenses on scientific apiary

Items included in Table 2 were interest on non-recurring cost, recurring cost, interest on recurring cost and depreciation on permanent article. Total annual expenses incurred to Rs. 22595. Percent share on interest on non-recurring cost was highest with 37.66 per cent followed by recurring cost, depreciation on permanent article and interest on recurring cost with 31.20, 28.81, and 2.32, per cent respectively.

## Table 3: Gross monetary Income

In the Table 3 detailed of gross monetary income on apiary was given. Total gross income earned by an apiary was Rs. 50200 based on the sale of 50 kg of honey and 1kg of bee wax produced from 10 colonies during the entire rearing period. Thus, net profit of Rs. 27605 which comes out to Rs. 2760.50 per colony. B:C ratio was 2.22, which indicates that apiary enterprise was in profit.

depicts that Re.1 investment in apiary intern gives return of Rs.1.22 as profit.

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