

BENEFIT-COST ANALYSIS OF APICULTURE ENTERPRISE: A CASE STUDY IN DISTRICT CHAKWAL, PAKISTAN

Tabinda Qaiser*, Ayesha Tahir*, Sajida Taj* and Murad Ali*

ABSTRACT:- The main focus of the study was to calculate benefit-cost analysis of beekeeping in Chakwal. The data was collected from 25 beekeepers of Chakwal district because this enterprise is working more in areas like Chakwal, Sargodha, FatehJang and Mardan. Beekeepers were selected randomly for case study and they were interviewed for getting the necessary data to determine the costs and return of beekeeping and assess the scope of beekeeping. The benefit cost ratio of beekeeping was 1.4709 which showed that this business was profitable. It will be a great source of employment creation for the rural poor people to reduce the poverty. There is a great prospect of beekeeping in Pakistan on the basis of the socio-economic context of the country and some special features of the enterprise.

Key Words: Apiculture; Benefit-cost Analysis; Survey; Pakistan.

INTRODUCTION

Pakistan currently has around 0.4 million honeybee colonies; each colony houses around 15000 - 20000 honeybees. It is reported that scientific and practical experience has proved that cross pollination of flowers of entomophilous crops by insects is the most effective and cheapest method of increasing crop yield. Besides increasing the yield, bee pollination also improves the quality of seeds and fruits. The cost of planned pollination of plants by bees is annually recovered by 15 - 20 times over through the value of additional crop yield. The income from agriculture in regions of intensive cultivation, obtained after using bees in plant pollination, is 14-15 times greater than the cost of honey and wax produced (Iqbal, 2013).

Apiculture is being promoted by the Pakistani government to support

income generation for the rural communities. It is currently not widely practiced in the country but it has the potential to provide increased income. Beekeeping requires very little capital for start-up; little land; less labour; and can easily be practiced by men, women, youth and people with disabilities alike. This means that beekeeping provides an opportunity for many different members of the community to use available natural resources to support their livelihoods (UEPB, 2005).

Depending on the part of the country and other environmental factors, a typical colony of bees can produce 80-120 pounds of surplus (harvestable) honey and 10-18 pounds of pollen in an average year. Besides selling honey and other bee products, such as beeswax, pollen, royal jelly, propolis, bee venom, or queens beekeepers can also provide

* Social Sciences Research Institute, National Agricultural Research Centre, Islamabad, Pakistan.
Corresponding author: tabinda.narc@gmail.com

pollination services (hive rentals) to farmers and orchardists (Admin, 2011). Honey is also prized as medicine (Shu'aib et al., 2009). Beekeeping does not compete with other enterprises for resources as the bees use nectar and pollen grains of plants.

Bee farming is an important seasonal activity that has predominantly remained rudimentary and unexploited, yet it has tremendous potential for widening the country's export base. As, in many societies, honey is regarded as an important ingredient in diet and is also used as medicine (chemotherapy). Honey and other hive products are demanded for their many useful properties and applications in a wide range of industries, keeping in view the importance of this unexploited field, the present study is an effort to examine the benefit-cost analysis of beekeeping in the study area.

MATERIALS AND METHOD

The present study was conducted in District Chakwal which is famous for honey production in Pothwar region. The purposive random sampling method was used. A purposive sample, also commonly called a judgmental sample, is one that is selected, based on the knowledge of a population and the purpose of the study (Babbie, 2001).

A well structured questionnaire supplemented with an interview schedule was used to elicit information from the beekeepers. Benefit-cost analysis was applied as an appropriate tool to evaluate the apiculture enterprises by Devkota (2006). The cost and benefit sides were separately computed and the cost side divided the benefit side to compute the B-C ratio. The cost items were grouped into two categories, i.e., i) fixed costs and ii) variable costs. To find out the total cost (TC), total fixed cost (TFC) was added to total variable cost (TVC). Likewise, average cost (AC) was obtained by adding average fixed cost (AFC) and average variable cost (AVC) as $TC = TVC + TFC$, and $AC = ATC + AVC$. Where, $AC = TC/No. \text{ of colonies}$.

On the benefit side, all the benefit items were studied and evaluation of apiculture industry was made. The benefit-cost ratio was computed by using the formula $B/C = TR/TC$

RESULTS AND DISCUSSION

There were four movements of honey bee colonies in a year (Table 1). In citrus season, i.e., March – April the movement of 25 days is to Sargodha with the transportation cost of Rs. 11000 and obtained 6kg honey hive⁻¹ with the sale price of Rs.220kg⁻¹. After citrus, beekeepers shift their

Table 1. Seasonal movements (No. of movement of colonies in a year = 4)

Season of colony movement	No of hives	Month of movement	Duration (months)	Movement from	Movement to	Transport. cost (Rs.)	Quantity (kghive ⁻¹)	Price (kg ⁻¹)
Phulai	170	April	1.5	Sargodha	FatehJang	14000	10	220
Berry		August	2	Chakwal	Basal		7	750
Brassica		December	2	Mardan	Chakwal	8000	-	-
Citrus		March	25 days	Basal	Sargodha	11000	6	220

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colonies to *Brassica* for 2 months i.e., December - February from Sargodha to Mardan and then to Chakwal with the transportation cost of Rs. 8000 but no honey is produced in this season. Later August-September, the colonies were shifted to Basal in berry season and kept for 2 months. In this season the bee keepers harvest 7 kg berry honey hive⁻¹ with the sale price of Rs. 750 kg⁻¹. Then during the Phul-ai season, in April their movement is to FatehJang for 1.5 months with the transportation cost of Rs. 14,000 and get 10 kg honey hive⁻¹ with the sale of Rs. 220 kg⁻¹.

Cost and Return of Beekeeping

The cost of production of bee keeping is calculated in detail to get the deep insight of the enterprise. Then benefit cost analysis was performed to ascertain the profitability of the bee keeping enterprise. The cost of production was calculated for keeping 170 bee hives. Total cost was Rs. 1013560 in which Rs. 735460 was fixed cost that is invested in the start of the enterprise. While, the variable cost was Rs. 278100. The honey production from hive⁻¹ year⁻¹ was about 23 kg which brings about income of Rs. 1490900 (Table 2). It is

Table 2. Benefit-Cost analysis of apiculture (170 hives)

	(Rs.)
Fixed Cost	Expenditure
Cost of 170 hives (10 frames each) with bees @ Rs. 3000 hive ⁻¹	510000
Wax sheet 1kg @ Rs. 450kg ⁻¹	76500
01 Honey extraction machine (Local)	7000
Two smokers (Local made) @ Rs.200 each.	400
Hive tools (hammer, knives, hand saw etc.)	350
1700 Bee frames @ Rs.70 frame ⁻¹	119000
05 kg steel wire (26-30 gauge) @ Rs. 150kg ⁻¹	750
Bee-veil 04 Nos. @ Rs. 90 each	360
Two pairs of gloves @ Rs. 50 each	100
Honey canes (50 Nos. @ Rs. 250 cane ⁻¹)	12500
Miscellaneous expenses approx. Rs.50 hive ⁻¹ or colony	8500
Total	735460
Recurring (one year)	
Full time labour (@ Rs.6000 month ⁻¹)	144000
Sugar per single colony (kg 8months) @ Rs.60kg ⁻¹	81600
Medicine/ chemical treatment with formic acid & Apistan strips for mite control for single colony	2000
Transportation charges per year	33000
Rent charges/ season	15000
Miscellaneous & unforeseen expenditure	2500
Total	278100
Total cost = (735460+278100)	1013560
Income	1490900
Net Income= (149090 - 101356)	477340
BCR (B/ C) = (149090/101356)	1.4709

therefore, concluded that the benefits were more than the cost and hence benefit cost ratio was 1.4709 from the present study. The results are quite similar to the study in Ethiopia i.e., from traditional hives, an average of 5-6 kg honey could be cropped hive⁻¹ year⁻¹. However, in areas where improved technology has been introduced, 15 - 20 kg hive⁻¹ year⁻¹ honey yield have been recorded (Nuru, 1999). Importance of pollination to achieve higher yields has largely been ignored in Pakistan. Therefore, the farmers have less or no knowledge about its benefits and importance (Iqbal, 2013).

Thus apiculture is a very good enterprise but it is not given the due importance and remained unexploited area however it has great potential to support the rural livelihood. The present study was an effort to highlight the importance of this less exploited field. The benefit-cost analysis of beekeeping is calculated to determine the returns from this enterprise. The benefit-cost ratio of apiculture enterprises was 1.4709. It showed that beekeepers were getting profit, which was a good source of income especially for the rural people.

Marketing facilities, capacity building of bee keepers, timely loan facilities on low interest, reduction in use of pesticides, plantation of floral plants, development of floral calendar etc. are suggested activities for development of apiculture in the area. In the light of present result, apiculture is a profitable business which could promote sustainable rural livelihood. However, the government should promote this industry by offering incen-

tives to the professional farmers.

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