

Short Communication: Profitability of beekeeping using locally made transitional top bar beehive in Wolmera Woreda, Oromia Region, Ethiopia

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Abstract. Gobena WE. 2020. *Short Communication: Profitability of beekeeping using locally made transitional top bar beehive in Wolmera Woreda, Oromia Region, Ethiopia. Asian J Agric 4: 1-4.* Beekeeping is an important source of livelihood and can be integrated with other agricultural activities. The objective of this study is to assess the profitability of beekeeping using locally built transitional top bar hives. A two-stage sampling procedure and stratified sampling technique were used in the study. Primary and secondary data were collected and analyzed using descriptive statistics and partial budgeting. The partial budgeting result reveals that beekeeping is profitable by using this hive with an incremental net benefit of 462.12 ETB. The beekeepers increased their benefits from the hive by more than 2.9-fold by using this beehive as compared to traditional hive. The study concludes beekeeping with this hive can be profitable business for the marginal farmers who have little business capital and land resource. Moreover, income from a single bee colony at beekeeper's backyard can be improved with minimum cost if this hive is used. The overall finding of this study underlined the importance of extension support and technical backing for beekeepers to use this hive.

Keywords: Beehive, beekeeping, locally made, profitability, transitional top bar

INTRODUCTION

Beekeeping plays a valuable part in improving rural livelihoods of many countries like Tanzania and Nigeria (Ajao and Oladimeji 2013; Ntalwila et al. 2017). Its success can be noted in countries like Ethiopia (Mazorodze 2015). Many studies show the importance of beekeeping from different aspects. It can be viewed as a means of combating poverty (Goldenberg 2004; Mickels-Kokwe 2006; Ogaba 2002; Lalika 2009; Ayansola 2012). Other studies have shown that beekeeping practices are an important income-generating activity, promoting employment and tourism revenue (Joni 2004; Wodajo 2011; Ajao and Oladimeji 2013; Chazovachii et al. 2013; Kaiser et al. 2013; Wongelu 2014). It also can play major role in natural resource management and ecosystem service via pollination (Chazovachii et al. 2013; Ndegwa 2014). Several studies have shown that investment costs are relatively low, being less than 50% of income generated, making beekeeping a thriving business that can contribute invaluablely to a household income (Saha 2002; Bradbear 2009; Ndegwa 2014; Wongelu 2017). Evidence from the Central Statistical Agency (CSA) shows there is an increase in the number of hives from 6.2 million in 2017 to 6.5 million hives in 2018.

Ethiopia has large apicultural resources and the potential of producing over 500,000 tones of honey per year (Ethiopian Apiculture Board [EAB] 2016). The annual production of honey and beeswax is low compared to its

potential (EAB 2016). This is due to more than 95% of our beekeepers using traditional hive management practices which affect yield. This results in traditional production system which results in low production and productivity, poor pre- and post-harvest processing and handling techniques and practices combined with poor marketing efforts have kept it part of the subsistent sector (Meaza 2010). In most cases, Ethiopian beekeepers are observed to use traditional hives, which is very difficult to manage honeybees, and to produce honey and honey products in the required quality and quantity. The maximum yield obtained from a traditional beehive so far is estimated on average to be below 7 kg /hive (Nuru 2004). However, it has been observed that more than 15kg /hive crude honey can be produced if top-bar hive is used (Nuru 2004). Locally made transitional top bar beehive is important for our farmers as it is extremely inexpensive and equally important as that of machine-made top bar hives (Melaku 2005; Wodajo 2011; Wongelu 2014; 2017). A study conducted by Wongelu (2017) showed honey yield which ranges from 10.25kg/hive/season to 37kg/hives/season harvested using this hive. Profitability of the beekeeping business is influenced by type used, ecological condition, colony strength and management practices (Tucak et al. 2004; Al-Ghamdi et al. 2017). Therefore, the main objective of this study is to assess the profitability of beekeeping using locally made transitional top bar hives within the study area.

MATERIALS AND METHODS

Study area

The study was conducted in Wolmera District, Oromia Special Zone Surrounding Finfinne, Oromia Region, Ethiopia from 2012-2013. A detailed description of study area is presented below.

Wolmera district

The Wolmera district is one of the districts in Oromia Special Zone Surrounding Finfinne, Oromia region. It is about 30 km away in West of Addis Ababa along the Ambo road at 9°02'N and 38° 34'E. The district is split into two agro-climatic zones namely highland 61%, mid-highland 39 % (Bureau of Agriculture [BoA] 2013). Crop-livestock mixed farming system characterizes agriculture in the district. The major crops in the farming system that provide foraging resources for honeybees are fabacean, chickpea and lentils (BoA 2013). In the district, about 3,566 hives exist out of which about 1853 are traditional, 870 transitional and 843 box hives (BoA 2013).

Method of data collection

The study used both primary and secondary data sources. Primary data was collected from sample households using structured interview schedule, personal observation of sites and group discussion. Secondary data that supported primary data was collected from different sources like journals, research articles, internet, and concerned offices.

Data analysis

To perform profitability analysis, production costs for both traditional and locally made transitional beehive types were considered. The analysis was carried to estimate per hive net return from both types of hive. Based on the survey data, the costs of production and returns at the prevailing prices were used to estimate the benefits. This section aims at identifying and quantifying the different

costs, which are incurred by the beekeepers in production process. Beehive, bee colony, supplementary feed, labor, transport cost, depreciation cost on beehives and interest on input costs, were the cost items that are needed to run locally made transitional top bar and traditional beehive honey production. Honey yield was the benefit of both types of beehives.

Profitability analysis of each beehive type was determined using the following formula shown below. Simple descriptive statistics farm budget techniques and Gross Return analysis frequency, percentages and tables were utilized. The farm income model is as shown:

$$NI = GR - TC$$

Where:

NI : Net Income for honey production.

GR : Gross Revenue to honey production (the revenue from honey sale)

TC : Total production cost (direct expenses and purchases for beekeeping activities).

RESULTS AND DISCUSSION

Profitability of the Hive

Honey yield is an important determinant factor in adopting the technology. To compare the performances of the locally made transitional top bar and traditional beehive yield, the cost and net returns obtained from sampled respondents were recorded and compared. The analysis was done to arrive at per hive net return from both types of beehives. As shown in Table 1, hive, bee colony, supplementary feed, labor, and transport costs were the cost items that needed to run locally made transitional and traditional beehive honey production and categorized under column one, category of cost.

Table 1. Partial budget for locally made transitional and traditional beehive

Added cost (Birr)	Costs		Revenue		
	Locally made transitional beehive	Traditional beehive	Additional return (Birr)	Locally made transitional beehive	Traditional beehive
Hive cost	45.0	4	Honey yield in pound	20.75	10.6
Colony cost	90.0	90.0	Total added return	799.85	312.65
Supplementary feed	2.76	1.91			
Labor cost	27.75	46.63			
Transport cost to market	3.87	2.74			
Interest	8.47	7.49			
Total costs of production	177.85	152.77	Total return from sell of honey	799.85	312.65

Note: Net income from locally made transitional top bar beehive (799.85-177.85=622.00 ETB); Net income from traditional beehive (312.65-152.77=159.88 ETB); Incremental net benefit of locally made transitional top bar beehive is (622.00-155.99=466.01 ETB)



Figure 1. A. Locally made transitional top bar beehive; B. laminating the hive; C. Honeybee colony established using the give; D. honey harvested from the hive

Based on the data collected from sampled beekeepers, hive cost and service life for the hives were on average 435.00 Ethiopian Birr (ETB) and 10 years for locally made transitional and 20 ETB and 5 years for traditional hive (1USD=18.2226 ETB in January 2013). The average price paid to purchase a bee colony was 450.00ETB at current market price (2013), the commercial life for the honeybee colony was assumed to be 5 years provided that this colony is not used for reproduction and renting the colony for pollination service (this is not practiced in the country). This cost was common for both types of hives. Labor cost was calculated based on hours spent in beekeeping for both types of beehives per month, summed for a year and converted to Birr which was 35.00 ETB for daily laborer. Similarly, feed cost and transport cost was calculated based on cost spent on the items divided by number of beehives and interest 5% was added on total costs.

On the other hand, honey yield was the benefit for both types of beehives and categorized under column two, return. To get the total revenue from each type of hive, honey yield obtained over the year was multiplied by selling price. In the study area, the average honey yield per annum for traditional and locally made transitional top bar beehive was 9.41 kg and 4.81 kg, respectively. It is below the national average which is 10-15 kg and 7kg respectively (Nuru 2004). The price of one-kilogram honey

from locally made transitional top bar and traditional beehive was 65 and 85 birr, respectively. The price difference was due to the quality of honey harvested from the beehives.

The partial budgeting result reveals that beekeeping is profitable by using locally made transitional beehive. Table 1 also summarizes that the incremental net benefit of locally made transitional beehive 462.12 ETB. This shows that the beekeepers increased their benefit from locally made transitional beehive more than 2.9-fold compared to traditional hive. Melaku (2005) also came with similar conclusion in his study using partial budgeting analysis that timber made Kenyan top bar hive was beneficial and remunerative.

Conclusion and recommendations

In conclusion, beekeeping is potential income-generating activity with relatively low investment and operation costs. It could be an effective business for farmers who have little business capital and land resource. Income from a single bee colony at beekeeper's backyard can be improved with minimum cost if locally made transitional top bar beehive with its package used. This study underlines the importance of extension support to beekeepers in the use of this hive technology.

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