

PROFITABILITY OF BEEKEEPING USING LOCALLY MADE TRANSITIONAL TOP BAR BEE HIVE

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Beekeeping is one of the livelihood sources in most developing countries and plays a valuable part in improving rural livelihoods. It is an important income-generating activity which can be possible to integrate with other agricultural activity. The main objective of this study was to assess the profitability of beekeeping using locally made transitional top bar hive in the study area. As to method, two stage sampling procedure was followed to select rural Village Administrations and households for the study. Four Village Administrations were randomly selected and stratified sampling technique was employed to stratify respondents in to users and non users of locally made transitional top bar bee hive technology. A total of 120, 40 users and 80 non users, respondents were randomly selected using probability sampling technique. Structured interview, focus group discussion and personal observation of sites used to gather primary data from respondents. Secondary data collected from relevant sources such as Woreda livestock office, research articles and internet. Collected data analyzed using descriptive statistics and partial budgeting. The partial budgeting result reveals that beekeeping is profitable by using locally made transitional top bar bee hive. It shows that the incremental net benefit of 462.12 ETB and the beekeepers increased their benefit from the hive by more than 2.9 fold by using this bee hive compared to traditional hive. The study concludes beekeeping could be an effective 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 locally made transitional bee hive with its package used. The overall finding of this study

mainly underlined the importance of extension support and technical back to the beekeepers to use this hive.

Keywords: Beekeeping, Bee hive, locally made, profitable, transitional top bar

Statement of the Problem

Beekeeping is one of the livelihood sources in most developing countries and plays a valuable part in improving rural livelihoods. Its success can be noted in countries like Ethiopia (Mazorodze, 2015). Many studies show importance of beekeeping from different aspects. It can be viewed as a means of eradicating poverty (Goldenberg, 2004; Mickels, 2006; Ogaba, 2007; Lalika, 2009; Ayansola, 2012). Others have shown that beekeeping practices as an important income-generating activity, employment and tourism (Joni, 2004; Workineh, 2007; Ajao and Oladimeji, 2013; Chazovachii et. al., 2012; Kaiser et. al., 2013; Wongelu, 2014). Others demonstrated as it plays major role in natural resource management and ecosystem service via pollination (Chazovachii et. al., 2013; Ndegwa, 2014) and other studies demonstrated investment costs are relatively low being less than 50% of the income generated, making beekeeping a thriving business that can contribute invaluablely to a household income (Saha, 2002; Bradbear, 2009; Ndegwa, 2014; Wongelu, 2017).

Ethiopia has large agricultural resource and potential of producing over 500,000 tones of honey per year and the annual production of honey and beeswax is low compared to its potential (Ethiopian Apiculture Board [EAB], 2016). This is due to the reason that more than 95% of our beekeepers use traditional hive management practices which

affect yield. This results in traditional production system which result in low production and productivity, poor pre and post harvest processing and handling techniques and practices combined with poor marketing efforts has 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 as more than 15kg /hive crude honey can be produced if top-bar hive is used (Nuru, 2004). Locally made transitional top bar bee hive is important for our farmers as it is extremely inexpensive and equally important as that of machine made top bar hives [Melaku (2005), Workineh (2007), Wongelu (2014, 2017)]. A study conducted by Wongelu (2017) also shows honey yield which ranges from 10.25kg/hive/season to 37kg/hives/season harvested using this hive. Profitability of beekeeping business is influenced by type of used, ecological condition, colony strength and management practices (Tucak et al., 2004; Al-Ghamdi, A.A. et. al., 2017). Therefore, the main objective of this study is to assess the profitability of beekeeping using locally made transitional top bar hive in the study area.

MATERIALS AND METHODS

Description of the Study Area and Period

The study was conducted in Wolmera Woreda, Oromia Special Zone Surrounding Finfinne, Oromia Region, Ethiopia from 2012-2013. Detail description on study area presented below.

Wolmera Woreda

It is one of the Woredas in Oromia Special Zone Surrounding Finfinne, Oromia region. It is about 30 km away in West of Addis Ababa along the Ambo rode at 9⁰2N and 38⁰ 34E. Altitude ranges from 2000-3380 m.a.s.l. (Bureau of Agriculture [BoA], 2013). The Woreda is bounded in the North by Sululta Woreda, in the South by Sebeta Awas Woreda, in the West by Burayu city

administration and in the East by Ejere Woreda. The Woreda is classified in to two agro climatic zones namely Dega 61%, Woynadega 39 % (BoA, 2013). The area is characterized by mean annual rainfall of 1067mm and mean temperature of 18⁰c. The main rain season is from the months of June to September which accounts for 70% rainfall while the remained 30% is from February to April (BoA, 2013). The Woreda has a total population of 146,227 of which 72,301(49.4%) are males and 73,926(50.6%) are females. In term of area residence 100,857(68%) population has been living in the rural areas while 45,370(31%) has been living in the urban centers (BoA, 2013). Crop- livestock mixed farming system characterizes agriculture in the Woreda. The major crops in the farming system are wheat, teff, barley, and faba bean. In the Woreda, about 3,566 hives exist out of which about 1853 was traditional, 870 transitional and 843 box hives (BoA, 2013).

Method of Data Collection

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

Method of Data Analysis

In order to perform profitability analysis, major production costs for both traditional and locally made transitional beehive types are considered. The analysis was done to arrive at 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. Bee hive, bee colony, supplementary feed, labor, transport cost, depreciation cost on bee hives and interest on input costs were the cost items that needed to run locally made transitional top bar and traditional bee hive honey production. Honey yield was the benefit for the both types of bee hives.

Profitability analysis of each bee hive 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 Returns to honey production (the income from honey sale)

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

RESULTS AND DISCUSSION

Profitability of the Hive

Yield is an important determinant factor in adopting the technology. The higher the yield obtained from the introduced technology easier it is to convince the farmers to adopt the technology. In order to compare the performances of the locally made transitional top bar and traditional bee hive 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 bee hive. As shown on the table one below, hive, bee colony, supplementary feed, labor and transport costs were the cost

items that needed to run locally made transitional and traditional bee hive honey production and categorized under column one, category of cost. 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 on average in January 2013). The average price paid to purchase bee colony was 450.00ETB at current market (2013), the commercial life for the honey bee colony was assumed to be 5 years and this cost was common for both type of hives. Labor cost was calculated based on hours spent in beekeeping for both types of bee hive per a 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 for the items divided by number of bee hives and interest 5% was added on total costs.

On the other hand, honey yield was the benefit for the both types of bee hives and categorized under column two, return. To get the total revenue from each type of hive, honey yield obtained in the course of the year was multiplied by selling price. In the study area, the average honey yield per

Table 1. Partial budget for locally made transitional and traditional bee hive

	Column 1		Column 2		
Added cost (Birr)	locally made transitional bee hive	Traditional hive	Additional return (Birr)	locally made transitional bee hive	Traditional bee hive
Hive cost	45.0	4	Honey yield	799.85	312.65
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

Source: own data computation, 2013

Net income from locally made transitional top bar bee hive (799.85-177.85=622.00 ETB)

Net income from traditional bee hive (312.65 - 152.77=159.88 ETB)

Incremental net benefit of locally made transitional top bar bee hive is (622.00 -155.99=462.12 ETB)

annum for traditional and locally made transitional top bar bee hive was 9.41kg and 4.81kg, 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 bee hive was 65 and 85 birr, respectively. The price difference was due to quality of honey harvested from the bee hives.

The partial budgeting result reveals that beekeeping is profitable by using locally made transitional bee hive. Table one also summarizes that the incremental net benefit of locally made transitional bee hive 462.12 ETB. This shows that the beekeepers increased their benefit from locally made transitional bee hive 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 RECOMMENDATION

As to conclusion, beekeeping as a business is comparatively less expensive income generating activity. It could be an effective business for the marginal 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 bee hive with its package used. The overall finding of this study mainly underlined the importance of extension support and technical back to the beekeepers in using this hive.

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