Full Length Research Paper

Economic implication of modern behive at Gechi district, Southwestern Ethiopia

Esayas Negasa Hambisa

Department of Agribusiness and Value Chain Management, Mettu University, P. O. Box: 318, Mettu, Ethiopia.
*Corresponding author. Email: esof452@gmail.com

This study was conducted to analyze economic importance of modern bee hive at household level in Gechi District of Buno Bedele zone, Southwestern Ethiopia with an objectives of comparing modern and traditional beekeepers in economic benefit, identifing the determinants of modern beehive use and level of income and evaluate the implication of modern beehive in social issues at household level. Multi-stage random sampling technique was implemented to select the representative sample techniques. Both the primary and secondary data was used during data collection. A total of 60 household from three kebeles were selected for interview. Data obtained were analyzed using descriptive statistics and econometrics analysis. Heckman regression a method is used to analysis the determinants of modern beekeeping use and level of income. The results of the study indicated that driving force to have bee colonies comprises 93.5% for income and 6.5% for consumption purpose. It showed that the average income of households with modern beekeeping (Birr 4570.4/household) was significantly (p<0.01) higher than those households with traditional beekeeping (Birr 1804.8/household). Despite relative investment in using modern beekeeping, households' gross income increased by 250% compared to the traditional beekeepers. The robust result indicates that (relying on selection observables and assuming no selection bias) the mean income of households has significantly increased due to improved beekeeping. Over all, modern beekeeping have created improved livelihood in terms of better income so as enhancing capability to buy household demands and productive investments, it is suggested that future research and development interventions should focus on the modern beekeeping development technologies specially for women as the interventions contribute most to the economic and social issues.

Key words: economic importance, modern bee hive**,** Gechi

INTRODUCTION

Background

Ethiopia is one of the countries of the continent that has the largest honey bee population and a big potential of honey production due to its varied ecological and climatic conditions. It is home to some of the most diverse flora and fauna in Africa that provide surplus nectar and pollen to foraging bees (Chala *et al*., 2012). Beekeeping is therefore one of the major areas of intervention for poverty alleviation in Ethiopia (Bhusal and Thapa, 2005). Ethiopia has a share of around 23.58% and 2.13% of the total Africa and world honey production, respectively. The country is the leading honey producer in Africa and one of the 10 largest honey-producing countries in the world, cited by (Gidey and Kibrom, 2010). Beekeeping for instance, does not require fertile land as well as large area. Males and females of all working age groups can practice it. It also requires little initial capital. However, the products obtained from honey bees are low and unstable due to several technical land socio-economic

constraints.

The small holders farmers are expected to increase market oriented beekeeping production and productivity, as well as their sustainable livelihood through the interventions. Even though those organizations are contributing much in the dissemination of the technology, there was no adequate study on production and productivity of Beekeeping in the study area. In addition to this, the livelihood change of those farmers was not adequately assessed so far. This research aimed at assessing the economic implication of the interventions for socio-economic progress participation and decision in beekeeping activities.

Objective of the study

The overall objective of the study was to assess the processes and economic importance of market oriented beekeeping development in Gechi district, and draw implications to scale out and up the experiences. Whereas, the specific objectives were:

➢   To compare modern and traditional beekeepers in economic benefit;

➢   To identify the determinants of modern beehive use and level of income;

➢   To evaluate the implication of modern beehive in social issues at household level.

MATERIAL AND METHOD

Description of the Study Area

A Gechi district is located in Buno Bedele zone. The area is found between Dabena and Didessa rivers. Didessa River bounds the district from east to north. On the other hand Dabena River bounds the area from west to north which joins Didessa and finally leads to Blue Nile. It has 28 administrative kebeles. The *Meher* season is that of the long rainy season, which occurs from June to September. Generally this rainy period provides ideal growing conditions for the longer maturing crops which can be harvested during September to February. On the other hand, the Belgseason refers to small but timely rainy season, which normally occurs from February to May. Short maturing crops are grown during this period for harvest during June or July (CSA, 2009).

Types and Sources of Data

Both primary and secondary sources were used. Primary data sources were modern honey producer farmers from six purposely selected Kebeles and soybean traders (wholesalers, retailers, and local collectors).

Secondary data was collected from different sources, such as: District Agricultural Office, District Trade and Market Development Office, District Cooperative Promotion Office, ECX, reports, bulletins and websites.

Published and unpublished documents were extensively reviewed to secure relevant secondary information.

Sampling Procedure and Sample Size

For this study, a multi-stage random sampling technique was implemented to select the representative sample techniques. In first stage, Gechi district was selected purposively since the location is chosen for its relatively large contribution total honey output in Buno Bedele zone. In the second stage, with the consultation of Woreda livestock and fish development office, Gito, Seko and Embero kebeles were purposely selected based on having high potential for honey production. Probability proportional to size (PPS) was used to determine the number of farmers. Finally, using the list of apiculture producing households in sampled kebeles, 60 sample farmers bee keepers were selected randomly.

The sample size determination was resolved by means of Yamane (1967) sampling formula with 95 percent confidence level.

$$n = \frac{N}{1 + N(e)^2} \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots. (1)$$

n= sample size for the research use
N= total number of households in four soybean producing Kebeles

e= margin of errors at 5%
n= $\frac{70}{1+70(0.05)^2}$ =59.57~ 60

As a result, 60 modern beehive producer farmers were selected for the purpose of the study.

Methods of Data Collection

Enumerators who have college diploma were recruited and trained to implement data collection using structured questionnaire. Data was collected under continuous supervision of the researchers.

Methods of Data Analysis

Descriptive and econometrics analyses were used for analyzing the data collected from farmers in the study area.

RESULT AND DISCUSION

Economic Importance of modern beehive at household level

The economic importance of beehive discussed the income at the household level with modern and traditional beekeepers. The difference in income was done by the

Table 1. Average gross income of households(mean+SE) with modern and traditional beekeeping

Beekeeping type	Number of Households sampled(n)	Average gross income (Birr/household)	Pr
Traditional	31	1804.8 ± 135.4	
Modern	29	4570.4 ± 295.7	
Difference		-2765.6 ± 323.1	0.0000

Source: Own data computation

Table 2. Average per capita income of household (mean + SE) with modern and traditional beekeeping

Beekeeping type	Number of Households sampled(n)	Average gross income (Birr/household)	Pr
Traditional	31	347.7 ± 27.5	
Modern	29	765.6 ± 58.5	
Difference		-417.8 ±64.3	0.0000

mean comparison which was not matched the modern and traditional beekeepers. To get the importance of improved beekeeping matched result was discussed.

Difference in gross income of households: modern and traditional beekeepers

The driving force to have bee colonies comprises 93.5% for income and 6.5% for consumption purpose. The result implies beekeeping has both as a source of income and food diet. The average gross income of households with modern and traditional beekeeping is given in Table 1. The results showed that the average income of households with modern beekeeping (Birr 4570.4/household) was significantly (p<0.01) higher than those households with traditional beekeeping (Birr 1804.8/household). Despite relative investment in using modern beekeeping, households' gross income increased by 250% compared to the traditional beekeepers.

Similarly, there was a highly significant difference (P<0.001) in average per capita income between households with modern (Birr 765/head) and traditional (Birr 347/head) beekeepers. This implies that modern beekeepers have higher per capita income than the traditional beekeepers Table 2.

The mean comparison statistics indicate that modern beekeepers are better off in terms of income but this does not imply that the difference is solely due to improved beekeeping management. Other factors (both observable and unobservable) might have contributed to the income difference between the modern and traditional beekeepers.

Determinants of modern beehive use and level of income

The estimated result of the Heckman regression model is given below indicates there is no selection bias because lambda is significant at about 52% (Table 3)

The robust result indicates that (relying on selection observables and assuming no selection bias) the mean income of households has significantly increased due to improved beekeeping. Over all, modern beekeeping have created improved livelihood in terms of better income so as enhancing capability to buy household demands and productive investments, it is suggested that future research and development interventions should focus on the modern beekeeping development technologies.

The Implication of modern beehive in social issues at household level

The change in social issues related to education, health and nutrition, wealth status and gender participation was discussed. Health and nutrition, wealth status and gender participation was presented in percentile while the educational expenditure and human capital of modern and traditional beekeepers was in matched results.

Health and nutrition

The difference in the percentage of sickness between households adopting improved beekeeping and traditional beekeeping management is identified. About 63.6% of the modern beekeepers were not sick in 2015. In addition to this, one and two times of sickness consist 12.1% and 11.1% respectively. Similarly, 4.1% for the three times of sickness and 9.1% for greater than three times was identified. The study result also shows 43.6% of the traditional beekeepers were not sick and 17.8% were sick one times. Two and three times of sickness were indicated by 12.9% and 16.8% respectively. The traditional beekeepers sick greater than three times were 8.9% in 2008.

The results indicated that improved beekeeping

6

Table 3. Heckman selection model two-step estimates

Variable	coef	Std err	z	p>z	95% coef interval	
Income bee						
modern	398.363	61.97485	6.43	0.000	276.8946	519.8315
traditional	1278.941	88.45986	14.46	0.000	1105.563	1452.319
Media help	-324.3463	151.3243	-2.14	0.032	-620.9366	-27.75608
Bee training	-818.303	1126.567	-0.73	0.468	-3026.333	1389.727
Quality probability	3982.705	671.5055	5.93	0.000	2666.578	5298.831
const	-2888.648	1882.004	-1.53	0.125	-6577.309	800.0126
Use improve hive						
Educational status	-0.7892756	0.2139275	-3.69	0.000	-1.208566	-0.369985
No family	0.009598	0.0041915	2.29	0.022	0.0013827	0.0178133
ln age	0.6060848	0.39731	1.53	0.127	-0.172628	1.384798
Land size	0.006333	0.013099	0.48	0.629	-0.01934	0.0320066
Const	-2.513756	1.438554	-1.75	0.081	-5.33327	0.3057588
Mills lambda	688.5497	1059.34	0.65	0.516	-1387.719	2764.818

Number of obs = 60, Censored obs = 31, Uncensored obs = 29, Wald $chi^2(5)$ = 275.82,
Prob > chi^2 = 0.0000   Source: Own data computation

adopters showed greater percentage (63.6%) than traditional beekeepers (43.6%) on no sickness in 2015. This implies modern beekeepers have improved the health of their family. Similar to this study, in where areas with caloric intake is low, the inclusion of honey in the diet will help supply needed carbohydrates. If basic calorie requirements are met, protein foods may be used by the body as protein (Kerealem *et al.,* 2009). The increase of honey production in rural Ethiopia is important for the control of malnutrition in children (Hussien, 2000).

Wealth status

Modern beekeepers in Gechi Woreda have improved their income and wealth status. The study result showed based on their wealth status before and after the modern technology. About 46.5% of the respondents were poor previous to the use of modern beekeeping; 43.4% and 10.1% of the beekeepers were medium and rich respectively. The result also describe that 62.6% of the respondents be medium likewise; 36.4% and 1% were rich, poor in traditional beekeeping respectively. Still these figures showed that a set of efforts is needed to be done to improve wealth status of the modern beekeepers from medium level into rich households.

SUMMARY, CONCLUSION AND RECOMMENDATION

Summary and Conclusion

The study was carried out in Gech Woreda, Buno Bedele Zone of Ethiopia to evaluate the economic importance of market oriented beekeeping development practices at household level and evaluate the importance of market oriented beekeeping development in social issues such as education, health and nutrition.
Multi-stage random sampling technique was implemented to select the representative sample techniques.

Both the primary and secondary data was used during data collection. The primary data was collected from smallholder farmers of purposively selected kebeles. Data obtained were analyzed using descriptive and econometrics regression analysis. A Heckman regression method is used to analysis the importance of modern beekeeping use and level of income on education, human capital and per capita income of the households.
The driving force to have bee colonies comprises 93.5% for income and 6.5% for consumption purpose. The result implies beekeeping has both as a source of income and food diet. It showed that the average income of households with modern beekeeping (Birr 4570.4/household) was significantly (p<0.01) higher than those households with traditional beekeeping (Birr 1804.8/household). Despite relative investment in using modern beekeeping, households' gross income increased by 250% compared to the traditional beekeepers.

Recommendation

Over all, modern beekeeping have created improved livelihood in terms of better income so as enhancing capability to buy household demands and productive investments and finally, it is suggested that future research and development interventions should focus on the modern beekeeping development technologies.

REFERENCES

Bhusal S, Thapa R (2005). Comparative study on the adoption of improved beekeeping technology for poverty alleviation; Journal Institute of Agriculture and Animal Sciences, 26: 127-135.
Chala K, Taye D, Kebede, Tadele (2012). Opportunities and challenges of honey production in Gomma district

6

of Jimma zone, South-west Ethiopia.

CSA (Central Statistics Agency) (2009). Survey on Livestock, Vol. 11, No. 331, Addis Ababa, Ethiopia.

Gidey Y, Kibrom F (2010). "Beekeeping for rural development: its potentiality and constraints in eastern Tigray, Northern Ethiopia". Agricultural Journal, 5(3): 201-204.

Hussein Moustafa (2000). Beekeeping in Africa I - North, East, and West African Countries. Plant Protection Dept., Faculty of Agriculture, Assiut University, Assiut, Egypt, p 32 – 48.

Kerealem E, Tilahun G, Preston TR (2009). Constraints and prospects for apiculture research and development in Amhara region, Ethiopia.

Yamane T (1967). An Introductory Analysis, 2nd Ed. New York: Harper and Row.