

BEE KEEPING ON HOUSEHOLD INCOME. A CASE STUDY OF MASIRA SUB COUNTY BULAMBULI DISTRICT

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Abstract

Beekeeping is increasingly recognized as a useful and promising practice to boost the livelihood of people that combines goals of sustainable agricultural development for resource-poor tropical farmers with greater environmental benefits than less diversified agricultural systems, pastures, or monoculture plantations. Among these expected benefits is the conservation of a greater part of the native biodiversity in human-dominated landscapes that retain substantial and diversified tree cover. Although the protection of natural habitat remains the backbone of biodiversity conservation strategies, promoting agro forestry on agricultural and other deforested land could play an important supporting role, especially in mosaic landscapes where natural habitat has been highly fragmented and forms extensive boundaries with agricultural areas. Bee keeping is receiving greater attention in many countries to protect the land from various types of degradation. The study then shown that 30% strongly agreed, 41% agreed, 4% were not sure, 20% disagreed and 5% strongly disagreed to the fact that availability and improper use of harvesting equipment. Poor harvesting methods Rudimentary harvesting methods, for example, using too much smoke or burning the hives, leads to destruction of the bee colonies as well as to contamination of the honey harvest and quality control challenges. Farmers annual incomes from honey can be improved through increasing the adoption of improved bee hives. The higher income also motivates the beekeepers to adopt the technology more intensively.

Key words: bee keeping, agriculture and household income

Background of the study

Beekeeping is increasingly recognized as a useful and promising practice for supporting human livelihoods, combining sustainable agricultural development goals for resource-poor tropical farmers with greater environmental benefits than less diversified agricultural systems, grasslands or monoculture plantations (Allan et al., 2023). These expected benefits include maintaining a greater proportion of native biodiversity in human-dominated landscapes that retain substantial and diversified tree cover (Collins et al., 2023). Although habitat protection remains the backbone of biodiversity conservation strategies, promoting agroforestry on agricultural and other deforested land could play an important

supporting role, especially in mosaic landscapes where the natural habitat is highly fragmented and forms extensive borders with agricultural areas (Niyonzima, 2023). Bee keeping is given more attention in many countries to protect the soil from various types of degradation. Beekeeping offers significant benefits for the long-term sustainability of agriculture, is a tool to achieve sustainable agricultural management and improve the quality of life of affected communities while simultaneously reversing the process of environmental and soil degradation (Francis et al., 2023). It is a dynamic ecologically based natural resource management system (Young, 2009). A study of more than 700 households in East Africa found that

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at least 50% of these households started planting trees ten years ago on their farms, such as calliandra, species, apples, avocados, to diversify their productivity (Collins et al., 2023). Beekeeping practices combine agriculture and forestry to create integrated and sustainable land use systems. Beekeeping practices take advantage of the interactive benefits of combining trees and shrubs with crops and/or livestock production (Kazaara & Christopher, 2023). In Mukono District, Uganda, a honey

development program revealed that beekeeping is a traditional practice that has existed in the area for many years (Joventa et al., 2023). Furthermore, most of the people in these areas practice three main agricultural practices, namely beekeeping, poultry and livestock, which have helped in controlling soil erosion, increasing crop yields for commercialization, increasing incomes contributing to poverty reduction and promoting socio-economic development (Godfrey et al., 2023).

Statement of the problem

In order to promote agricultural diversification and reduce poverty in Uganda, beekeeping is one of the main agricultural activities supported by the government's poverty program. Mitigation (Vincent & Peter, 2023). Despite the potential importance of beekeeping as a means of poverty alleviation for rural communities, it has largely failed in Uganda, although the Ugandan government and other corporate development partners have since invested more than billions of shillings in small and emerging beekeeping projects. (Richard et al., 2022). Over 2,000 people have been trained and equipped in the past years, yet the contribution of beekeeping to household income has not been widely explored. This study therefore assessed the impact of beekeeping on household income in Amuru District, Amuru District, Northern Uganda.

Specific objectives

1. To establish the effect of bee keeping on the household income of the people Masira Sub County, Bulambuli District.
2. To find out the problems faced by bee keepers in Masira Sub County, Bulambuli District.

Methodology

The study adopted a descriptive and experimental research design which attempt to answer a research question that asks what effects one variable has on another variable. It described situations and events such that, an observer observes an event or a situation and tries to describe it as best as he/she can according to how things unfold. The study involved both qualitative and quantitative approaches during data collection. The target population for the study was 98 bee keeping farmers who practice beekeeping since they were considered as having relevant data for the study. The researcher considered a sample size of 98 respondents and this was determined using Israel Glenn (2012) formula $n = \frac{N}{1 + Ne^2}$ where n is the sample size, N is the study population while 0.05 is the level of precision. This method involved giving all the members in the target population an equal chance of being selected to participate in the study.

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The researcher sought assistance from the local administration and the village heads. A list of household heads was requested from the village heads. Respondents was chosen randomly from the list and the name of the household heads chosen was marked until the entire sample required is exhausted. Through the simple random sampling, a sample of 345 respondents was picked. The current study used questionnaire method in collecting data. The researcher used this method to collect data because it is convenient as respondents fill questionnaires during their free time and have a chance to consult for views and information about the research problem. This method produced a more focused and relevant data for the study.

The data was coded, categorized and analyzed using computer software packages MS Excel (2010). Quantitative data was analyzed by SPSS which generated frequency tables, charts and graphs to present the findings (Nelson et al., 2022). Qualitative data generated from the interviews was analyzed through careful interpretation of meanings and contents and ordering and ranking with descriptive manner. The presentation of data was done using tables bar graphs and pie charts that was drawn using micro soft excel program.

RESULTS

Table 1 Establish the effect of bee keeping on the household income of the people Masira Sub County, Bulambuli District

Respondents	SA		A		NS		D		SD		Total	
	F	%	F	%	F	%	F	%	F	%	F	%
There are Increased incomes levels among the people of Masira Sub County, Bulambuli District.	33	33.0	53	53.0	10	10.0	2	2.0	0	0.0	100	100
Increased food security for farmers Masira Sub County, Bulambuli District.	56	56.0	40	40.0	2	2.0	0	0.0	2	2.0	100	100
Increases agricultural productivity	46	46.0	34	34.0	6	6.0	9	9.0	5	5.0	100	100
Bee keeping reduces farmers vulnerability to climate variability which increases crop yields	28	28.0	56	56.0	5	5.0	9	9.0	2	2.0	100	100

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According to the table, 35% of the respondents strongly agreed respectively that there are increased incomes levels among the people of Masira Sub County, Bulambuli District. Accordingly, 10% were not sure, 2% disagreed to the idea. From the findings, Livelihood of communities living in mountain areas is typically dependent on subsistence agriculture and smallholder farming. Rural mountain communities generally require an additional source of income, especially cash income, to meet their routine livelihood requirements (Ntirandekura & Samwuel, 2022). Findings of the study suggest that beekeeping is proven to be such an alternative livelihood option which provides an alternative income security to smallholder farmers living in rural mountain areas of Chitral (Allan et al., 2023). Findings of the study illustrate that both beneficiary and non-beneficiary households included in the study were able to use income earned from beekeeping for household benefit 56% of the respondents agreed to the notion of increased food security for farmers of Masira Sub County, Bulambuli District. Bee keeping practices by farmers, 40% agreed, 22% were not sure, while 2% strongly disagreed to the idea (Christopher et al., 2022). The impact of beekeeping demonstration on livelihood of the community is assessed based on house hold interview using structured questionnaire before and after beekeeping intervention. This includes household land uses, farm sizes, major crops grown; tree species preferences for charcoal production, the frequency and annual production of charcoal, beekeeping management practices and income from the sale of honey were interviewed (John et al., 2023).

Top bar hive demonstration and training

The two chefeke beehives were constructed and provided for each participant for honey production. On top of this the training was provided how to construct the chefeke hives, seasonal bee management and importance of integrating beekeeping for forest conservation and sustainable honey production. After training the chefeke hives were occupied with bee colonies by transferring from traditional hives. Then honey was harvested and recorded from FRG members. The data was analyzed using paired independent t- test.



Figure: Training of farmers on Transitional hives

The table then shows that 46% of the respondents strongly agreed that there is increased agricultural productivity, 34% agreed, 6% were not sure, 9% disagreed while 2% strongly disagreed to the idea. 28% of the respondents strongly agreed that Bee keeping reduces farmers' vulnerability to climate variability which increases crop yields (Grace et al., 2023). This was substantiated by a view of one respondent who expressed that, beekeeping contributes to economic

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security in another way: through the positive effect on pollination in agriculture in the rural areas of developing countries. Even though pesticide use is still on the rise in modern agriculture, managed pollination has been able to make up for certain pollinator deficiencies, and has increased productivity and thus incomes (Oromo et al., 2023). In a verbal interview, the respondents stated that beekeeping can contribute to securing sustainable livelihoods by transforming vulnerabilities into security. It can be carried out by resource-poor farmers, and is particularly suitable for under-privileged, landless and low-income groups as well as for women, as it requires minimal start up investment and generally yields profits within the first year of operation (Husaini, 2012).



Figure 2: Home Garden beekeeping apiary of the sample household

Table 2; Problems faced by bee keepers in Masira Sub County, Bulambuli District

Response	SA		A		NS		D		SD	
	F	%	F	%	F	%	F	%	F	%
Low returns from beekeeping	28	28.0	66	66.0	6	6.0				
availability and improper use of harvesting equipment	30	30.0	41	41.0	4	4.0	20	20.0	5	5.0

Limited and un organized markets and market channel	38	38.0	56	56.0	6	6.0				
Low quality of honey products	41	41.0	56	56.0	3	3.0				
Shortage of trained personnel	61	61.0	30	30.0	9	9.0				
Low levels of improved technologies	28	28.0	66	66.0	6	6.0				

Source: Primary, Data, 2022

From the table 2, 28% of the respondent say that there is low returns from beekeeping, further from the findings, many farmers have left beekeeping because of low levels of profits and low yields and due to the amount of work and the investments that are required for hives and equipment, Poor apiary husbandry Especially in the migratory beekeeping system (Grace et al., 2023), but also in fixed apiary system, bees are left to look for their own forage and water, and to provide own security from invaders., 66% of the respondents agree and 6% were not sure about this. The study then shows that 30% strongly agree, 41% agree, 4% are not sure, 20% disagree and 5% strongly disagree to the fact that availability and improper use of harvesting equipment. Poor harvesting methods Rudimentary harvesting methods, for example, using too much smoke or burning the hives, leads to destruction of the bee colonies as well as to contamination of the honey harvest and quality control challenges. Due to limited availability and improper use of harvesting equipment, honey becomes susceptible to contamination and adulteration resulting to low quality honey which cannot enter the formal market chain, but ends up in the informal markets being used as an ingredient for making local brews or herbal products.

From the study, 38% of the respondents confirmed the assertion that u Limited and un-organized markets and market channel, 56% of the respondent agreed, 6% were not sure. The study went ahead to discover that a well-organized market channel is one of the main driving factors for expansion of honey production. Through market channels, producers can be linked to potential buyers. An increased participation of farmers in these channels also leads to more supply for honey processors. In Bulambuli District, there has not been a strong organized market channel for bee products. Limited of standards and grading systems discourage farmers to produce high quality products. As a result, the honey price received varies based on the good will of buyers.

According to the table, 41% of the respondents noted that there is low quality of honey products, 56% of the respondents agreed and 3% were not sure. The study also established that limited adequate production skills and post-

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harvest handling at all levels often results in poor quality of honey on the market. Excessive use of smoking during harvesting and using inappropriate containers are serious problems in this respect that increase processing cost for processing companies. Since honey producers have limited knowledge of the preferences of their target market, they do not try to make any changes in the quality of their product. The low price also discourages the farmers to add value. Most honey on local markets is un-extracted, unstrained and has post-harvest handling problems it should be noted that 56 (56%) respondents bitterly emphasized the challenges and 41% strongly emphasized the challenges while only 3% disagreed.

According to the table. 61% of the respondents say that Shortage of trained personnel, 30% of the respondents agreed and 9% were not sure. It was established that the above challenges affect the bee keeping practices as some times reduce greatly on the firm performance on profitability level of the farmers. The verbal findings of the study also indicated that there are still challenges faced by bee keepers, well trained staff plays a significant role in informing actors in the honey channel. There is shortage of skilled personnel for beekeeping management, post-harvest handling, bee product marketing at all levels (federal, regional and district levels) and processing and quality control in the country this increases the knowledge gap of the beekeepers in the rural areas.

From the table, 28% of the respondents noted that there are low levels of improved technologies, 66% of the respondents agree and 6% were not sure with the idea. low levels of improved technologies were reported verbally by the respondents who said that it leads to loss of profits, loss of customers as they migrate to other dealers and loss of customer's goodwill. The same challenge was reported to lead to delays in delivery of both the products to the market and also the raw materials from the manufacturing of the products.

Relationship between Beekeeping on the household income of the people Masira Sub County, Bulambuli District.

Table 3: showing kind of relationship between inventory management and performance

Relationship	Frequency	Percentage
Positive	88	88
Negative	12	12
Total	100	100

Source: Field data, 2022

From the table 3 above majority of the respondents 46 (92%) said that improved techniques of bee keeping production have positive relationship between Bee keeping on the household income of the people Masira Sub County, Bulambuli. Most of the respondents went ahead and said that the relationship between the Bee keeping on the household income of the people Masira Sub County, Bulambuli District from above results may hence indicates that proper use of Bee keeping techniques like Improved fallows, Alley cropping, Growing multipurpose trees and shrubs on farmland, and

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Plantation/crop combinations. However, basing on the most of the study respondents as eluded in table above, they study therefore established that there is positive relationship of Bee keeping on the household income of the people Masira Sub County, Bulambuli District as was revealed by majority 46(92%) of the covered respondents during data collection process.

Conclusion

Bee keeping arrangements are one of the options in this regard. This study analyzed the impact of Bee keepings farming on household income originating from organic honey production in the Masira Sub County, Bulambuli District. Factors which affect household income from honey production were also investigated. In addition, the structure and functioning of Bee keeping farming are examined.

The first part of the study deals with the function and structure of Bee keeping farming. The nucleus estate model of farming is used in the study area, which includes owning of a production site and collection of honey. The Bee keeping document used for the agreement contains obligations and rights of parties, and stipulations regarding quantity, quality, pricing and enforcement. The price is determined through negotiation based on the market price of honey. Farmers can get from 15 to 20% higher price if they fulfil the quality requirements as described in the agreement.

Recommendations

Although participation in Bee keeping farming positively affects household income, it was indicated that farmers awareness of Bee keeping farming is very low. Organizing experience sharing programs among farmers, preparing field visits for farmers and workshops for concerned governmental officials and NGOs can help to increase the awareness of Beekeeping honey production.

Transitional hives are more productive than traditional hives and do not demand expensive high tech beekeeping accessories. The only costs involved are providing the design of the hives, training and initial support. In addition, transitional hives significantly improve the quality of honey since it allows farmers to inspect ripening of the honey. Farmers annual incomes from honey can be improved through increasing the adoption of improved bee hives. The higher income also motivates the beekeepers to adopt the technology more intensively. Therefore, honey processors, governmental and NGOs should intensively promote the adoption of transitional beekeeping to help farmers increase their income with low cost.

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