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Research Article

Participation of Youth in Beekeeping Technology in Amaya and Waliso Districts of Southwest Shewa Zone, Ethiopia

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Abstract

This study was conducted to evaluate contribution of beekeeping to youth's income in Amaya and Waliso districts of Southwest Shewa Zone. Purposive sampling was used to select study areas based on beekeeping potential and youth beekeeper's inability to benefit from beekeeping technology. A total of 46 youth beekeepers (female=44%) were participated in the project under FREG which contains 23 youths per kebele per district. Theoretical and practical training was given to youths, and honey bee experts. Qualitative and quantitative data were collected from both primary and secondary sources. Data were collected using checklists, focus group discussions, and direct observation. The narrative of response and content analysis methodologies were used to analyze qualitative data. While descriptive statistic like mean, percentage, and frequency counting was used to analyze quantitative data. The study results show that youth beekeepers obtained US$50,383.6 from honey sales, due to the hive productivity increased from 8 kg to 21.33 kg per hive annually. Moreover, the contribution of beekeeping to total youth income was 30.34% which could have a positive impact on their life. The life changing impact was as a result of strong beekeeping extension research. Hence, increased use of moveable frame bee hives with full package is important.

Keywords

Beekeeping, Income, Jobless, You, Rural

1. Introduction

In developing nations, beekeeping can help reduce poverty and preserve natural biodiversity because it is an environmentally friendly activity [1]. Additionally, it has been providing revenue to rural households and contributing to Ethiopia's national economy [2]. This activity provides various benefits to society [3], contributes to the sustainable development [4]. This is carried out through the generation of goods and services that often lead to an increase in the per capita income of families [5] as well as important opportunities, since it contributes to the creation of jobs, both directly and indirectly.

Youth unemployment is a major challenge facing many developing countries, particularly Ethiopia, potentially leading to an increase in social and economic crises [6, 7]. The national youth unemployment rate is 25.7 percent [8]. Oromia Region contributed the largest share of unemployed population to the total urban areas of the country by 18.2 percent. This situation is similar in Amaya and Waliso districts. But participation of economically active labor force in the production of goods and services can curb the above problems.

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In fact, improved beekeeping practices can contribute to create more job opportunities for landless youth for income generation and forest conservation [9]. It generates revenues in a relatively short period of time [10] as it is not necessary to have a lot of space for the hives, and the management of the activity allows the beekeeper to manage their time more flexibly than in other agricultural activities [11-13]. So, beekeeping can improve the beekeeper's financial security and help create employment due to the variety of products and services that are generated, thus contributing to increasing their economic income [12]. It can also stimulate various sectors, such as hive carpentry, honey trading, hiring of bee colonies for pollination, and other bee value additions [14].

The Ameya and Waliso districts have the potential for the development of apiculture in the Southwest Shewa Zone of the Oromia regional state. According to the Southwest Shewa Zone Bureau of Agriculture office, there are a lot of beekeepers, bee colonies, and diversified planted tree and shrub species that provide sufficient forage for bees. This situation will enhance the income of youth without job at household levels, thereby achieving the unemployment aim. Despite its potential, youth in the areas confront several obstacles that restrict their involvement in and ability to benefit from local development projects like beekeeping. Therefore, the purpose of this study was to evaluate the contribution that beekeeping has in the lives of youth beekeepers in the study areas.

2. Methodology

2.1. Description of the Study Areas

The study was carried out in the Ethiopian districts of Amaya and Waliso in the Southwest Shewa Zone of Oromia National Regional State. The town of Waliso (8°32′N 37°58′E), which is situated at 2063 meters above sea level and 114 kilometers Southwest of Addis Ababa, the nation's capital, serves as the administrative hub of the Southwest Shewa Zone (Figure 1). The town's natural hot spring draws tourists, which might open up a lucrative market for beekeepers. In addition, it serves as a welcome location for visitors to the Wonchi Volcanic Crater Lake. As of 2022, the Ethiopian Statistics Service [15] reported that there were 37, 867 people living in the town, with 101,796 women and 100,423 men. Amaya District is one of the districts in the southwest Shewa Zone, situated between 8 29'59, 99"N and 37 44'59, 99" E (Figure 1). Gindo, 30 kilometers from the Zonal Capital, Waliso, and 144 km Southwest of Addis Ababa, is the district's town. The study area is situated at an elevation of 1500–3240 meters above sea level. The research region has an average yearly temperature of 19.60C and annual precipitation of 1127 mm. The district had a total population of 122,056, of which 87,797 were males and 87,069 were women, according to the Ethiopian Statistical Service [16].

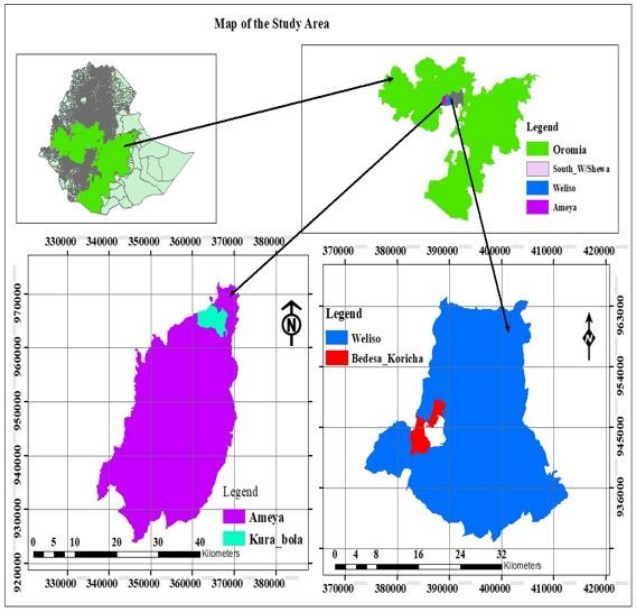

Figure 1. *Map of the study areas (2023).*

2.2. Study Areas and Youth Beekeepers' Selection

The districts of Amaya and Waliso were purposively chosen due to their potential for beekeeping, high rates of youth unemployment, and close follow up. The Holeta Bee Research Center and the Southwest Shewa Zone Bureau of Agriculture office first signed a memorandum of understanding outlining the goals of the project, its anticipated results, and the roles and responsibilities that each partner would play. Subsequently, two villages, Kurabola in the Amaya district and Badesakoricha in the Waliso district, were chosen at random to provide data for this study (Figure 1). Each site taught twenty-three youth beekeepers, for a total of forty-six. Selection criteria for beekeepers included their willingness to engage in the project, their inability to make ends meet, whether they were engaged in traditional beekeeping, and their ability to spread best practices. To guarantee participation, the study areas and youth beekeepers were chosen in collaboration with the relevant district staff.

Subsequently, extension agents and beekeepers received theory and practical training as a future resource for future. Then, honey bee colonies were carefully transferred into frame bee hives and implemented all management practices.

2.3. Data Sources, Data Types and Data Collection Methods

Qualitative and quantitative data were collected from both primary and secondary sources. A check list was used to collect quantitative data from youth beekeepers. However, focus groups, key informant interview, and close observation were used to collect data. A collection of questions was created in order to get differing viewpoints on similar concerns. Sec-

ondary data was gathered from documents that were both published and unpublished.

2.4. Methods of Data Analysis

Frequency counting, percentages, and means were used to analyze the quantitative data, which were then displayed in tables and charts. Narration of response and content analysis methods were used to analyze the qualitative data that was collected through focus group discussions, key informant interviews, and observation.

3. Results and Discussion

3.1. Demographic Profile of the Respondents

Tables 1 and 2 under this section provide the respondent's age, sex, educational status, family size, farm size, marital status, and number of bee colonies.

Age: The majority of the youth beekeepers can be regarded as "youth," as their average age at the time of the survey was 27.75 (Table 1). In order to sustain honey production in the study areas, many intend to continue beekeeping in the long run. *Sex*: Participants' sex was 44% female and 56% male. The close proportions show that, in contrast to earlier times, the number of female beekeepers is rising. This guarantees female's crucial responsibilities in reducing poverty and their ability to make decisions regarding their issues.

Education: Of the participants, 93.5 percent were well-educated; 34.78% had completed grades 9 through 12, and 26% had enrolled in an advanced program (Table 2). It demonstrates how education facilitates beekeepers' access to written resources that contain local and international beekeeping knowledge. This finding is consistent with the findings of Thomas and Fanaye [17], who noted that knowledgeable farmers can obtain information from a variety of sources and make effective use of their skills to obtain essential information.

Marital Status of the youth: Of the sample population, 52.17% were single and 47.83% were married. The married respondents claimed that their inability to find work drove them to marry in an effort to reduce their anxiety, which left their lives even more vulnerable. Family size: Table 1 reveals that the participants' average family size was 2.56, indicating that the respondents are young and have few children. Therefore, even though a work force is supposed to boost rural families' adoption of technology, having a lower labor force has no effect on beekeeping.

Farm size: The average farm size of the sampled respondents was 0.135 hectares, ranging from 0.125 to 0.25 hectares at the minimum and maximum. For landless and impoverished youngsters, beekeeping offers an opportunity to become self-sufficient.

Total number of colonies: Based on participant management, the average number of colonies was 4.1 (Table 1). This suggested that since honey production ensures financial security and economic empowerment, participants are more likely to express interest in it.

Table 1. *Summary statistics of the sample respondents for continuous variables (N=46).*

Variable	Min	Max	Mean
Age	20	29	27.75
Family size	1	4	2.56
Farm size	0.125	0.25	0.135
Total of colony owned	3	7	4.1

Table 2. *Summary statistics for sample respondents for categorical variables (N=46).*

Variable	Frequency	Percentage
Sex		
Male	25	55.55
Female	21	44.44
Total	46	100
Education		
Illiterate	3	6.5
Grade 1-4	6	13.04
Grade 5-8	9	19.57
Grade 9-12	16	34.78
Higher	12	26.09
Total	46	100
Marital status		
Single	24	52.17
Married	22	47.83
Total	46	100

Source: Own Survey (2023).

3.2. Honey Yield and Revenue from Moveable Frame Beehive

After receiving both theoretical and practical training, a thorough follow-up was carried out to verify whether or not youth beekeepers were improving their beekeeping management. The study shows that number of bee colonies managed by youth beekeepers increased by 121.74% in 2022 and 84% in 2023 (Figure 2). A surplus of money made in less

than a year motivates youths to start more colonies and produce more honey. This is due to the fact that a beekeeping activity can turn a profit within a year of its establishment [10].

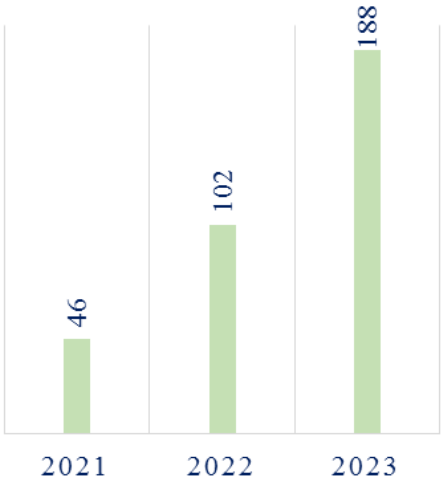

Figure 2. *Number of bee colonies across the year.*

The result was calculated using data on honey yield. The study result shows that movable frame bee hive productivity was increased from 8 kg to 21.33 kg on average. In the third year (2023), a higher mean honey yield (23.5 kg) was obtained from moveable frame bee hives annually (Figure 3). This result was nearly equivalent with the national average honey yield 20–30 kg/hive/year registered in Ethiopia [18]. Increased forage available to bees near the apiary site, improved beekeeping expertise, effective seasonal bee management techniques, and careful monitoring of honeybee colonies could all contribute to higher honey yields.

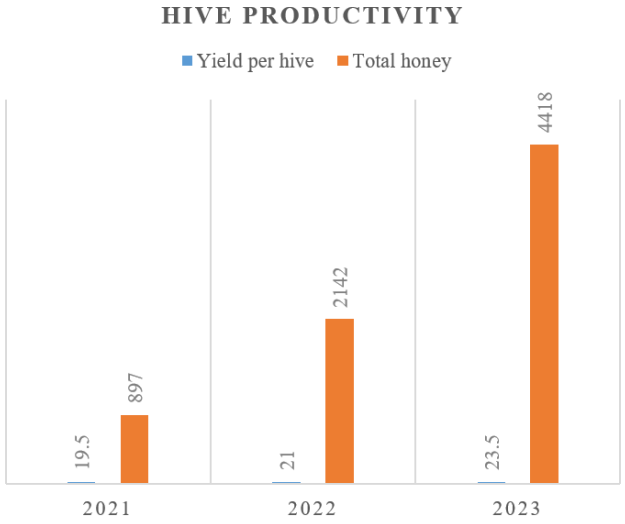

Figure 3. *Honey yield productivity and total honey across the year.*

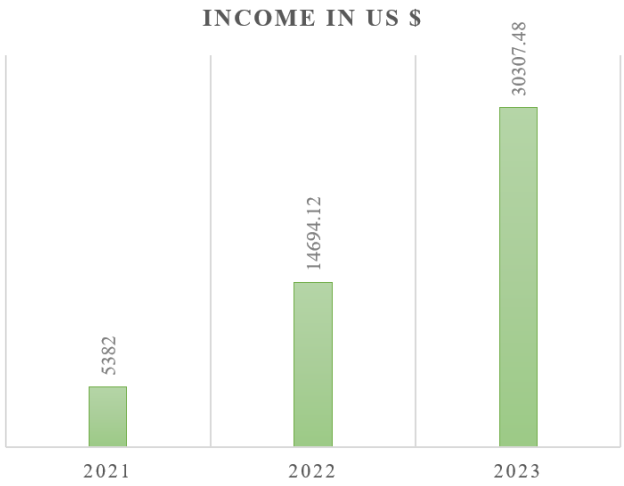

Figure 4. *Income from beekeeping across the yea.*

*A unit kg of honey was sold at US $6 for 2021 and US $6.86 for 2022 and 2023.

Each moveable beehive produced between 19.5 and 23.5 kilograms of honey per hive annually. Ultimately, during the project years, a total of 7,457 kg of honey was harvested (Figure 3), and US $50,383.6 was earned in the study sites (Figure 4). "Such quantity of honey per hive had never been harvested in the area which brings surplus income of the household," stated beneficiaries. Sales of honey generated around US $91.275 per month for youth beekeeping participants, indicating that it is a viable source of income for unemployed youth in the study areas. This demonstrates that, on average, a person with 20 beehives boxes can make US $ 2949.8 a year, which enables them to escape income poverty because they can make US $ 8.1938 per day, which is more than US $1.25. According to a 2015 report by the International Council for Social Development [19], the core objective of sustainable development is to eradicate poverty for all people worldwide, which is currently defined as those who live on less than $1.25 per day on average by 2030. Therefore, providing youth beekeepers enough beehive boxes can help in resolving the complicated issues of hunger, hopelessness, helplessness, and dependency as well as the movement of rural to urban regions.

3.3. Income Contribution of Beekeeping Technology to Youth

Based on the amount of money made from beekeeping relative to their total revenue from honey sales and other sources, the study areas' youth's income contribution from beekeeping was calculated (Figure 5). In the study areas, beekeeping accounts for 30.34% of household income, suggesting that it may help alleviate the financial situation of youth without job. If each youth person managed more than fifteen bee colonies, their contribution to beekeeping would be higher. This is because, in contrast to conventional agri-

cultural practices, it does not require fertile land or constant attention [10, 12, 13]. The trading of goods such as khat, charcoal, pepper, cereal crops, and the like accounts for 27.04 percent of their income, with wages coming in second at 22.04%.

3.4. Sustainability of the Project in the Study Areas

How many people embraced and shared the technology or knowledge provided to the farming community determines the extension system's sustainability and replicability. According to Leeuwis [20], trialability, observability, complexity, and technological compatibility are just a few of the variables that can have an impact on how easily technologies and approaches can be scaled up and adopted. A workshop was arranged with the objectives to formally end the project and to discuss its lessons learned and accomplishments. Ultimately, the project team turned over all of its operations to the appropriate agriculture sector agencies so that they could maintain the positive outcomes and expand into other youth and places. In addition, youth received protective cloths, honey extractors, and casting molds—tools that can be expensive but are necessary for producing large amounts of superior honey, which translates into higher income. The technique taken for group formation goes beyond only managing the firm as a group; it also involves having monthly meetings to exchange ideas, talk about pertinent topics, and make monthly contributions to raise funds.

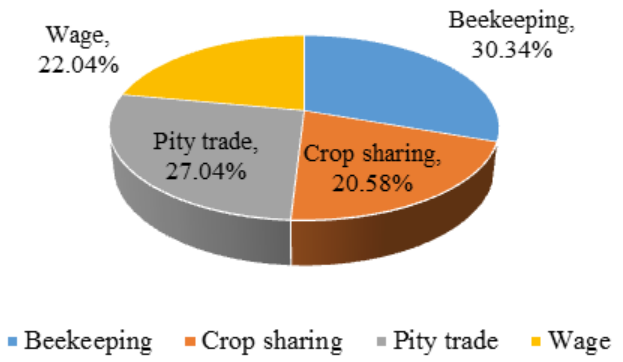

Figure 5. Proportion of income from beekeeping to youths' total income.

4. Conclusion and Recommendation

This study demonstrates how beekeeping helps the youth people without jobs in the studied areas. Quick increases in the number of bee colonies and their honey output are a result of both improved beekeeping techniques and diligent monitoring. The harvesting of sufficient amounts of honey is ensured by acquisition of beekeeping skills and strong bee colonies. Consequently, the average hive output increased from 8 kg to 21.33 kg per beehive box. Technology used in beekeeping has the potential to boost the yearly income of youth beekeepers, providing a viable means of support for unemployed youth in the study areas. Encouraging youth people to engage with beekeeping technologies can help in resolving the multifaceted issues of hunger, dependence, pessimism, and rural-to-urban migration. To help rural youth live better lives, the government and other development stakeholders should take advantage of this opportunity. We suggest the following actions:

1. Encourage youth people who are interested in beekeeping to produce honey. This means developing participants' skills, offering mentorship, maintaining harmonious group dynamics, and checking in often.
2. Promote the usage of moveable frame bee hive with packages more often in order to boost honey output and revenue. Moveable frame hives produce more than intermediate beehives in terms of quantity and quality, which brings in enough money.
3. Make the beekeeping extension program stronger. Provide the agricultural extension sector sufficient amount of budget.

Abbreviations

CSA	Central Statistics Agency
ISSC	International Social Science Council
ICSU	International Council for Science
US $	United State Dollar

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Author Contributions

Draft preparation, funding procurement, data collecting, data validation, formal analysis, editing, and critical evaluation were all done by Lalisa.

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Data Availability Statement

The data is available from the corresponding author upon

reasonable request.

Conflicts of Interest

The author declares no conflicts of interest.

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Biography

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