

BEES AS CHANGE AGENTS: EMPOWERING MARGINALIZED COMMUNITIES THROUGH BEEKEEPING IN ALBANIA'S RURAL AREAS

Manjola Kuliçi¹, Lumturi Sena², Vesna Karapetkovska – Hristova³, Arbenita Hasani^{4*}

¹Agricultural University of Tirana, Faculty of Biotechnology and Food, Department of Food Sciences and Biotechnology, Tirana, Albania

²Agricultural University of Tirana, Faculty of Agriculture and Environment, Department of Animal Science, Tirana, Albania

³University St. Kliment Ohridski, Faculty of Biotechnical Sciences, Bitola, Macedonia

⁴University Hasan Prishtina, Faculty of Agriculture and Veterinary, Food Technology and Biotechnology, Prishtina, Kosovo

Abstract

This study examines the potential of a beekeeping training program that was piloted in the Korça region of Albania for the first time. The program targeted rural youth, women, and individuals with lower levels of formal education, groups that are traditionally underrepresented in agricultural entrepreneurship. Using a mixed-methods approach involving surveys and in-depth interviews conducted over a six-month period, the study monitored 31 participants to evaluate skill acquisition, socioeconomic impacts, and behavioral changes. The results revealed that over 90% of the participants continued to actively practice beekeeping after the training and successfully managed the provided colonies, with the majority regularly applying the knowledge gained, particularly in hive maintenance and daily routines. This suggests a sustained practical effect within the pilot context. Women comprised 29% of the participants, representing progress in a historically male-dominated sector. Despite having only a secondary education or less, 45% of the trainees demonstrated their ability to apply new techniques and maintain hive stability effectively. The program also promoted environmental awareness and interest in sustainable rural entrepreneurship. Some participants began experimenting with value-added products, such as propolis, indicating early signs of innovation and diversification. These findings suggest that beekeeping training may contribute to rural engagement and inclusion-oriented initiatives, particularly by engaging youth and supporting greater gender participation in agricultural activities. The Korça pilot indicates that modest, targeted interventions may help strengthen skills, confidence, and engagement among vulnerable rural groups. While based on a single-site pilot, the results point to the potential of beekeeping training as an entry-level approach that could inform future initiatives in other regions of Albania.

Keywords: beekeeping, rural empowerment, youth engagement, gender inclusion, sustainable livelihoods

1. INTRODUCTION

Rural areas in Albania are often characterized by economic insecurity, high youth unemployment rates, and persistent gender inequality. Traditional farming is in decline, and many young people view migration as the only way to achieve economic security [1]. In this context, alternative forms of agricultural entrepreneurship, such as beekeeping, have emerged as low-cost, high-impact initiatives that can empower marginalized populations and stimulate local development [2, 3, 4, 5, 6, 7, 8]. Beekeeping offers unique opportunities: it requires relatively low startup capital, contributes to environmental sustainability through pollination and has the potential to generate income through honey and other bee product production [3]. Furthermore, beekeeping fosters community engagement, personal initiative and reconnection with nature- qualities that are essential for revitalizing rural economies [9, 10].

The Korça region, known for its rich biodiversity and traditional agricultural practices, was chosen as the location for a pilot training program in 2024. The program was designed not only to equip participants with theoretical and technical beekeeping skills, but also to help them become economically active and self-reliant. A previous study from the same region revealed that training in apiculture was a turning point for young, unemployed individuals, especially women, offering them a pathway to inclusive and sustainable rural livelihoods [11]. This paper presents an in-depth evaluation of the program, analyzing its socioeconomic impact six months after completion. The study's main goal is to determine if the training resulted in measurable improvements in participants' knowledge, practices, and livelihoods. Additionally, the study aims to identify the challenges encountered and the potential for scaling the program in other rural areas of Albania.

2. MATERIALS AND METHODS

2.1. Study Design and Setting

This study used a mixed-methods approach to evaluate the short and medium-term results of a beekeeping training program in the Korça region of southeastern Albania. The mixed-methods approach combined quantitative measures of participation, satisfaction, and adoption of practices with qualitative insights into participants' experiences, perceptions, and motivations. This approach enabled a comprehensive evaluation of behavioral changes, technical skill acquisition, and personal perceptions, aligning with the recommended practices for assessing applied training programs [12].

The Korça region was selected due to its strong agricultural tradition and favorable ecological conditions for beekeeping. Data collection was conducted over a six-month period following the completion of the training program, enabling an assessment of both immediate post-training outcomes and early evidence of practice retention and application.

2.2. Participants and Recruitment

A total of 31 participants were enrolled in the training program. Participants were recruited through collaboration with local authorities and rural development stakeholders in the Korça region. Selection criteria included unemployment or economic inactivity, lack of prior beekeeping experience, expressed interest in agricultural or rural livelihood activities, and willingness to participate in both the training and follow-up evaluation. Efforts were made to encourage the participation of young people and women, who are traditionally underrepresented in agricultural entrepreneurship in the region.

All participants were informed about the objectives of the training and the study. Participation in the questionnaires and interviews was voluntary, and informed consent was obtained before data collection began. To protect anonymity, all data were recorded and analyzed without personal identifiers.

2.3. Description of the Training Program

The beekeeping training program was structured over a four-week period, consisting of two weeks of theoretical instruction followed by two weeks of practical, field-based training. This structure was intentionally designed to support participants with no prior experience, facilitating a gradual transition from conceptual understanding to hands-on application. The theoretical component covered the core foundations of beekeeping, including honey bee biology, colony structure, seasonal colony dynamics, basic hive management principles, bee health, bee product production, and the role of bees in pollination and ecosystem sustainability. The program emphasized good beekeeping practices, safety considerations, and environmentally responsible approaches to small-scale apiculture.

The practical component took place in an apiary and emphasized direct engagement with beekeeping activities. Participants received training in the use of essential beekeeping equipment, routine hive inspections, identification of brood and food frames, seasonal management practices, and basic hive maintenance. Practical sessions reinforced theoretical knowledge through real-life demonstrations and repeated hands-on exercises. The training focused on small-scale, family-based beekeeping rather than commercial production. It prioritized simplicity, accessibility, and applicability to rural livelihoods.

2.4. Data Collection Instruments

Two primary quantitative data collection instruments were used. The first was a structured questionnaire, which was administered immediately after the training. It was designed to assess participant satisfaction with the training, its perceived usefulness, and their stated intentions to apply the acquired knowledge. The second questionnaire, administered six months after training completion, focused on continued application of beekeeping practices, maintenance of provided hives, perceived benefits, and challenges encountered during implementation.

In addition to the questionnaires, 12 participants were selected for semi-structured, in-depth interviews using purposive sampling. The selection aimed to ensure variation across age, gender, education level, and degree of post-training engagement. Specifically, interviewees included: (1) participants who had actively implemented beekeeping practices and identified as active beekeepers; (2) participants who maintained basic hive management without yet integrating beekeeping into their livelihood; and (3) participants who reported practical or environmental challenges during the six-month follow-up period. This strategy allowed for the inclusion of diverse implementation experiences within the pilot group.

The semi-structured interview guide followed a predefined thematic framework and included open-ended questions addressing: (1) perceived changes in knowledge, skills, and confidence; (2) specific examples of how training content was applied in practice; (3) motivations for continuing, expanding, or limiting beekeeping activities; (4) perceived economic, social, or personal impact; and (5) challenges encountered in colony management and seasonal transitions. Interviews lasted approximately 30–45 minutes and were conducted in person during follow-up field visits. Interviews were documented through written notes taken during and immediately after each session.

Field observations were also conducted during follow-up visits and recorded as structured field notes. These observations focused on observable beekeeping activities, including hive inspections, feeding practices, seasonal management behaviors, and participant engagement with colony management.

2.5. Data Analysis

The data collected through the questionnaires were analyzed using statistical tools to determine the frequency distribution, mean, and standard deviation of the different variables. ANOVA was applied to test for statistically significant differences in training evaluation and benefit perception among different age groups. Pearson correlation tests examined the relationships between demographic factors and changes in behavior or perception. Qualitative interview data and field observation notes were analyzed using thematic analysis. Interview notes were coded inductively to identify recurring themes related to skill development, motivation, perceived impact, and challenges. The qualitative findings contextualized and complemented the quantitative results.

3. RESULTS

3.1. Participant profile and training impact

The demographic composition of the 31 participants in the training program revealed important trends relevant to program targeting. The group consisted primarily of young adults: 54.8% were between 18 and 24 years old, and 35.5% were between 25 and 34 years old. Only 9.7% were older than 35. This dominant youth representation aligns with the program's objective of engaging younger, economically inactive individuals from rural communities.

In terms of gender distribution, the group included twenty-two male participants (71%) and nine female participants (29%). Although women were underrepresented compared to men, this level of inclusion is significant for a traditionally male-dominated sector like apiculture. Notably, the women were active throughout the training process and demonstrated strong retention and engagement in follow-up evaluations. Participants had diverse educational backgrounds, with 45.2% having completed only secondary education and 54.8% holding a university degree. This balance highlights the program's accessibility to individuals across different academic levels, especially those with limited formal training in agricultural practices. Regarding employment status, 58.1% were unemployed, 19.4% were students,

12.9% held temporary jobs, and 9.6% had stable employment. These data reflect the program's relevance for economically inactive groups. Notably, none of the participants had prior beekeeping experience, which confirms that the training is entry-level and opens new vocational pathways.

Participants had very positive immediate reactions to the training program. Evaluative data collected through a post-training questionnaire revealed high satisfaction levels across multiple dimensions, including course content, trainer clarity, material relevance, and overall usefulness. More than 87% of participants rated the training as "excellent," and 96.8% indicated that they would recommend it to others.

Six months after the training, a follow-up assessment confirmed that the initial enthusiasm had translated into sustained engagement. More than 90% of participants were maintaining the provided hives, and 65% were performing key hive management tasks independently, such as monitoring the queen, providing supplementary feed, and inspecting the colony. The remaining participants continued to maintain the provided hives and apply essential beekeeping practices at a household or learning level, including feeding, inspections, and basic seasonal care, but did not yet consider beekeeping a primary or secondary source of income. This distinction reflects a gradual transition from sustained engagement and skill application toward livelihood-oriented beekeeping.

Approximately 24% of participants had incorporated beekeeping into their regular livelihood activities and identified as active beekeepers. In this study, "active beekeepers" were defined as participants who had moved beyond basic hive maintenance and learning-level practice and were managing colonies with the intention of production, income generation, or long-term economic engagement. To better understand how participants were applying what they had learned, in-depth interviews and field observations were also conducted. Many participants described seasonal management strategies with confidence and expressed motivation to deepen their knowledge, including interest in experimenting with new techniques or expanding their activities in the future.

Additionally, around 13% of participants had started experimenting with value-added products, such as basic propolis extraction. These efforts are still in the very early stages, but they reflect an emerging interest in diversifying beekeeping outputs and moving toward more entrepreneurial practices.

3.2. From learning to doing

To analyze how learning outcomes and behavior evolve over time, we compared immediate post-training evaluations with six-month follow-up data. The key findings are summarized in Table 1. These results reflect stable satisfaction levels and meaningful behavioral change over time. At the end of the training, participants were asked about their satisfaction, with 87.1% reporting being "*very satisfied*" and 9.7% "*satisfied*", indicating that the training met or exceeded their expectations. At the six-month follow-up, participants were asked whether the training had met their needs. 88% stated that they had gained new skills and perceived the training as having a positive impact, while the remaining participants reported ongoing challenges or noted that more time was needed to evaluate the long-term outcomes.

The percentage of participants who actually put into practice what they learned (90%) closely matched the high level of declared intention (93.5%), showing that the training was not only motivational but also practically empowering. A minor decrease was noted in the percentage of participants who said they would recommend the program, dropping from 96.8% to 92%. This may be due to post-training challenges, which will be discussed below. However, overall willingness to recommend the program remained high, supporting its perceived value. Importantly, participants increasingly recognized beekeeping not just as a skill, but as a practical and relevant solution to rural challenges, highlighting its potential as a tool for long-term development.

Table 1. Transition from training to practice

Training outcome	Post-Training (%)	6-Month Follow-Up (%)
“Very satisfied” with training	87.1	-
Perceived positive impact of training	-	88.0
Would recommend training	96.8	92.0
Stated intention to start or expand beekeeping activities	93.5	-
Actual application of practices	-	90.0
Identified beekeeping as a rural solution	83.9	85.0

In addition to descriptive comparisons, statistical tests were conducted. A significant difference in satisfaction by age group was revealed by a one-way ANOVA ($F = 4.76$, $p = 0.015$), with higher levels of satisfaction being reported by younger participants (18-24). Pearson correlation analysis showed a moderate positive correlation between education level and implementation of practices ($r = 0.42$, $p = 0.031$). There was no significant difference between male and female participants ($r = 0.28$, $p = 0.10$), indicating that gender did not impact levels of technical engagement. The key results from the ANOVA and Pearson correlation tests are summarized in Table 2 below.

Table 2. Statistical highlights by participant profile

Participant Characteristic	Outcome Variable	Test Used	Statistical Result
Age group	Satisfaction with training	One-way ANOVA	$F(2, 28) = 4.76$, $p = 0.015$
Education level	Implementation of beekeeping practices (6 month)	Pearson correlation analyses	$r = 0.42$, $p = 0.031$
Gender	Implementation of beekeeping practices (6 month)	Pearson correlation analyses	$r = 0.28$, $p = 0.10$

These findings suggest that, although the training was effective overall, younger and more formally educated participants were particularly likely to respond positively and implement the acquired skills. Insights from the in-depth interviews further highlighted the program's personal impact. For some, it was the first time they felt genuinely involved in a hands-on learning process. Others emphasized the value of being part of a group and feeling recognized in a technical setting. The experience was frequently described as “empowering and unexpected.”

3.3. Challenges encountered during implementation

Overall, the outcomes were very positive. However, several participants reported challenges during the follow-up period. One recurring issue was the limited availability of technical support after the training ended. Although the trainers provided mentoring during the program, many participants expressed the need for continued access to expert guidance, especially during the fall and spring transitions when colony management becomes more complex. Another reported challenge was environmental variability. Fluctuations in temperature, rainfall and humidity affected colony stability [13]. Some participants lost their colonies early on due to improper ventilation or poor hive placement, underscoring the need for additional training in microclimate management and early intervention practices.

4. DISCUSSION

The results of this study suggest that when beekeeping training is well-designed and tailored to local needs, it may support knowledge transfer and contribute to early behavioral changes among marginalized rural groups. However, the findings suggest effects beyond knowledge acquisition. This kind of program may create opportunities for employment and small-scale entrepreneurship, particularly for youth and women in areas such as Korça, where unemployment, migration, and gender disparities remain relevant concerns.

First, the high implementation rate of 90% and continued hive management observed six months after training may indicate early signs of behavioral change and engagement. This outcome may be partly associated with the way the training was delivered. Participants worked with a combination of clear theoretical materials, real-life demonstrations, and hands-on sessions. This integrated approach, supported by simple instructions and accessible resources, made beekeeping understandable and manageable even for those with no prior experience, 45.2% of whom had only completed secondary education. These results are consistent with studies from similar contexts suggesting that simplicity of design and materials may support successful agricultural upskilling [14, 15].

Moreover, the statistical significance of age in determining satisfaction ($F = 4.76$, $p < 0.05$) is not just a numerical result; it is also a sociological indicator. Many of the younger participants were economically inactive and disillusioned by the labor market. For some participants, beekeeping appeared to represent not only a technical skill but also a new form of social and economic engagement. The high level of engagement among the 18-24 age group suggests that vocational programs combining identity-building with technical knowledge may contribute to youth engagement in rural areas. This aligns with global findings, including those by IFPRI (2021) [16], which emphasize that youth engagement in agriculture increases when opportunities are framed around innovation, autonomy, and personal meaning.

The program took a meaningful approach to gender. Although only 29% of the participants were women, no significant differences were observed in levels of technical engagement compared to male participants. Many participants said the training made them feel confident about managing hives and performing tasks that are often considered "men's work," such as hive monitoring and seasonal planning. This finding aligns with research suggesting that beekeeping may offer women additional opportunities beyond income generation. It may also facilitate access to technical roles from which women have often been underrepresented [9, 17].

While education level had a modest influence on practice implementation ($r = 0.42$, $p = 0.031$), the fact that many participants with only secondary education applied what they learned so effectively suggests that formal education may not be the only pathway to developing technical competence. The training's flexible format, use of visual materials, and step-by-step repetition made the content easier to understand and apply. This highlights the potential value of a learning model that is clear, inclusive and adapted to the needs of diverse learners.

Nevertheless, the findings reveal some areas of concern. Although satisfaction was high, several participants reported the lack of post-training mentoring as a significant limitation. Even with a solid foundation, first-time beekeepers may face challenges in managing colony loss or climatic stressors independently. Consistent with previous research, follow-up support may play an important role in strengthening the sustainability of pilot outcomes. This support can come in the form of peer mentorship, or community-based beekeeping groups (Beekeeping Associations) [2].

The observed changes among participants with no prior experience suggest that beekeeping training may provide new forms of technical engagement and participation in rural activities. It may provide individuals with opportunities for increased participation in local economic activities, regardless of their background [18, 19, 20]. In this context, beekeeping may represent more than a technical activity, potentially contributing to perceptions of empowerment among participants. In rural areas of Albania, this approach may contribute to rethinking vocational training as not only a path to employment but also a means of building confidence and independence. Given that the study was conducted in a single region, with a relatively small number of participants and includes self-reported data, the results should be considered within the methodological limitations of the study.

5. CONCLUSIONS AND RECOMMENDATIONS

The results of this pilot study suggest that structured beekeeping training may support continued engagement in small-scale rural activities. In the Korça district, over 90% of participants, many of whom had no prior experience, continued beekeeping activities six months after training. Participants reported applying their newly acquired skills in routine hive management and seasonal practices. This suggests that individuals from marginalized backgrounds may progressively develop technical competence with structured support. Beekeeping training appeared to extend beyond technical instruction, potentially contributing to economic participation and perceptions of empowerment within rural communities.

Given the positive outcomes observed in the Korça training program, future initiatives may benefit from incorporating ongoing support, including mentorship and seasonal guidance. Particular attention could be given to engaging youth and women through targeted outreach and inclusive learning approaches. Beekeeping may be considered not only as an agricultural activity, but also as a potential pathway toward economic participation and community engagement. Although this study was limited to one region, the findings may offer useful insights for similar initiatives in other rural areas, while recognizing the need for further study. Further longitudinal and multi-site research would be valuable in assessing longer-term socioeconomic outcomes.

ACKNOWLEDGMENTS

This research was financially supported by the Western Balkans Fund (WBF).

AI DISCLOSURE

AI-assisted tools were used for language editing. The authors reviewed and edited all content and take full responsibility for the final manuscript.

REFERENCES

1. World Bank 2024, *Western Balkans Regular Economic Report*, No. 26, Fall 2024” © World Bank.
2. Nicola, Bradbear 2009, “Bees and their role in forest livelihoods”, *Non-Wood Forest Products*, No. 19, FAO.
3. Kuliçi M., Sena L., Marcelino Jose A.P., Giordano R., Hasani A 2023, “Analysis of the economic and cultural value of beekeeping activities in Albania”, *4th International Conference on Agriculture and Life Sciences (ICOALS IV)*, held in Tirana, Albania 1-3 November 2023, Proceeding book P 311-312.
4. Aryal, S., Ghosh, S., & Jung, C 2020, “Ecosystem Services of Honey Bees; Regulating, Provisioning and Cultural Functions”, *Journal of Apiculture*, 35(2), 119–128.
5. Hanley, N., Breeze, T. D., Ellis, C., & Goulson, D 2015, “Measuring the economic value of pollination services: Principles, evidence and knowledge gaps”, *Ecosystem Services*, 14, 124–132.
6. Klein, A.-M., Vaissière, B. E., Cane, J. H., Steffan-Dewenter, I., Cunningham, S. A., Kremen, C., & Tscharntke, T 2007a, “Importance of pollinators in changing landscapes for world crops”, *Proceedings of the Royal Society B: Biological Sciences*, 274(1608), 303–313.
7. Patel, V., Pauli, N., Biggs, E., Barbour, L., & Boruff, B, 2021 “Why bees are critical for achieving sustainable development” *Ambio*, 50(1), 49–59.
8. Virgil, N & Simona, S 2020, “The Role of Partnerships in the Development of the Short Chains of Organic Honey Distribution” *Studies in Business and Economics*, 15(1), 142–157.

9. Pocol Cristina, Bianca & Molly McDonough 2015, “Women, Apiculture and Development: Evaluating the Impact of a Beekeeping Project on Rural Women’s Livelihoods”, *Bulletin of University of Agricultural Sciences and Veterinary Medicine Cluj-Napoca, Horticulture*, 72 (2).
10. Radivoj, Prodanović., Ivana, Brkić., Katarina, Soleša., Dragana, Ljubojević Pelić., Miloš, Pelić., Vojislava, Bursić and Jelena, Vapa Tankosić 2024, “Beekeeping as a Tool for Sustainable Rural Development”, *J Agron Technol Eng Manag*, 7(2), 1054-1066.
11. Kuliçi, M., Sena, L., Karapetkovska-Hristova, V & Hasani, A 2024, “Empowering youth and promoting rural development in Albania: Outcomes of an innovative beekeeping training initiative”, *1st International Colosseum Scientific Researches and Innovation Congress*, pp. 732-739, Italy, ISBN: 978-625-95275-1-2.
12. Momoh, J 2013, “Development of E-Learning Platform for Beekeepers”, *SEEM Res. Dev. J*, 2, 63–72.
13. Neuman, P & Straub, L 2023, “Beekeeping under climate change”, *Journal of Apicultural Research*, 62:5, 963-968
14. Food and Agriculture Organization (FAO) 2024, *Towards gender-responsive agricultural extension services in Albania- Assessment Report*.
15. Karapetkovska-Hristova, V., Ibishi, B., Limani, B., Pavlovic, I 2024, *Livestock and Beekeeping Sustainability in the Balkans: Current State and Future Prospects*, UDC: 636(497)”2018/2022”, 638.1(497)”2018/2022”.
16. Pyburn, Rhiannon & Anouka Van Eerdewijk (eds) 2021, *Advancing Gender Equality through Agricultural and Environmental Research: Past, Present, and Future*, Washington, DC: International Food Policy Research Institute, ISBN: 978-0-89629-391.
17. Olana, T & Demrew, Z 2018, “The role of women in beekeeping activities and the contribution of bee-wax and honey production for livelihood improvement”, *Livestock Research for Rural Development*, 30(7), 118.
18. Aksoy, A., Demir, N., Bilgiç, A 2018, *A Study on Identifying the Effectiveness of the Beekeeping Grants*, Provided by IPARD Program: Examples of Erzurum, Kars and Agri Provinces. *Custos E @Gronegocio*, 14, 269–283.
19. Duah, H.K., Segbefia, A.Y., Adjaloo, M.K., Fokuo, D 2017 “Income Sustainability and Poverty Reduction among Beekeeping ValueChain Actors in the Berekum Municipality, Ghana”, *Int. J. Dev. Sustain*, 6, 667–684.
20. Schouten, C.N., Caldeira, J 2021, “Improving the Effectiveness of Beekeeping Training: A Case Study of Beekeeping Instructors”, *Fiji.Bee World*, 98, 57–62.