

Socioeconomic profile and development dynamics of beekeeping families in Northern Albania

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Abstract: In its early stages, beekeeping was practiced primarily for household consumption rather than for economic benefit. This paper analyzes the socio-economic profile of beekeeping as an activity that contributes to household income and influences social dynamics both within and beyond the family context. To date, this topic has not previously been examined in northwestern Albania. Demographic indicators, including gender, age, family size, beekeeping experience, primary occupation, and participation in technical apiculture training, are analyzed in detail. Data were collected through field observations, online surveys, and official statistics involving 90 family beekeepers across nine areas representative of beekeeping activity. The collected data were processed and analyzed using descriptive statistics, and a geographic distribution map was developed. The results identify a basic profile of beekeeping families in northern Albania, characterized by strong family traditions in beekeeping, heterogeneous geographic distribution, and an increasing orientation toward tourism and tourism-related markets. The findings indicate that this sector has significant development potential, particularly in rural areas; however, it requires stronger institutional support, including modernization, greater age and gender inclusion, demographic renewal, and improved financial support.

Keywords: Dynamics of beekeeping, Socioeconomic profile of the beekeeper, Northern region of Albania, Development of beekeeping

1 Introduction

Insects are a major component of natural ecosystems, influencing plant reproduction, ecological balance, and food security. Among pollinating species, *Apis mellifera* accounts for a substantial share of pollination activity, contributing significantly to ecosystem functioning as a primary biological pollinator. Through pollination from flower to flower, bees increase the productivity of agricultural crops and wild plants, thereby supporting biodiversity and ecosystem sustainability. According to [1], plant biodiversity is closely linked to pollination processes in which bees play a central role. Previous research has shown that higher levels of plant biodiversity are associated with increased pollinator activity and the more sustainable functioning of agroecosystems. A decline in bee populations would therefore pose a direct threat to agricultural production and global food security [2], [3]. In addition to their ecological role, bees and beekeeping are also of considerable economic and social importance. Bee products, including honey, pollen, wax, venom, and royal jelly, are valued not only as high-quality food products but also as widely used raw materials in the pharmaceutical and cosmetic industries. These products contribute to value-chain development and income generation, particularly in rural areas where alternative economic activities are limited [4]. In this way, beekeeping represents a multifunctional sector that integrates environmental, economic, and social dimensions. An important aspect of the sector's development is its contribution to diversifying household incomes. In many rural and mountainous areas, where employment opportunities are limited, beekeeping is considered an accessible activity because of its relatively low initial investment and flexible management requirements. Furthermore, beekeeping creates natural synergies with agriculture and livestock production, improving resource-use efficiency and enhancing the economic sustainability of rural households [5]. From this perspective, beekeeping is increasingly recognized as an important component of integrated rural development. Another important dimension is the relationship between beekeeping, rural tourism, and emerging forms of sustainable tourism. These activities enhance the attractiveness of rural areas by offering experiences connected to nature, local traditions, and regional products. Consequently, they contribute to income generation and to the promotion of cultural and environmental heritage [6]. At the same time, beekeeping is considered an effective tool for improving the well-being of rural communities, creating employment opportunities, and promoting sustainable socio-economic development [7]. Given these considerations, the socio-demographic characteristics of families engaged in beekeeping are particularly important. Factors such as age, level of education, professional experience, and employment structure directly influence how beekeeping is organized, managed, and developed. These elements determine not only economic viability, but also the capacity to adopt innovative practices, increase productivity, and integrate into broader markets [8]. Characteristics such as age, gender, education, occupation, and experience are therefore key factors shaping the organization and management of beekeeping activities [9], [10]. In northern

Albania, previous studies have highlighted the impact of beekeeping on household economies and tourism development, emphasizing the region's significant potential [11]. Despite the sector's notable development, a detailed analysis of the socio-economic profile of beekeeping families in northern Albania remains limited. These gaps hinder the development of effective policies and support programs related to age and gender inclusion, product standardization, and market integration [12], [13]. This paper aims to help address these research gaps by examining beekeeping in northern Albania from a socio-economic perspective.

2 Study Methodology

2.1 Study Areas

This study examined the socio-economic profile and development dynamics of beekeeping families in northern Albania. The region has experienced considerable development within a landscape characterized by mountainous terrain interwoven with rivers, valleys, forests, and pastures. These natural conditions support the development of apitourism and contribute to the local economy [14]. The study focused on nine representative areas: Vermosh, Theth, Razëm, Tropojë, Bogë, Pukë, Fushë-Arrëz, Reç, and Bajzë-Koplik. Beekeeping activity in these areas demonstrates considerable heterogeneity, making them suitable for a cross-sectional regional analysis. The selected study areas were identified based on preliminary field knowledge and existing literature related to beekeeping development in northern Albania.

2.2 Data Collection Methods

Primary data on the socio-economic profiles and development dynamics of beekeeping families were collected using a cross-sectional study design. Data collection was conducted from June to August 2025 across all representative study areas. The questionnaires were structured in accordance with the study objectives and adapted to the respondents' educational levels. The study was reported in accordance with the STROBE guidelines, ensuring a clear and systematic presentation of the data and the applied analytical methods [15].

2.3 Conceptual and Analytical Framework

The diagram below provides a conceptual map of the study stages.

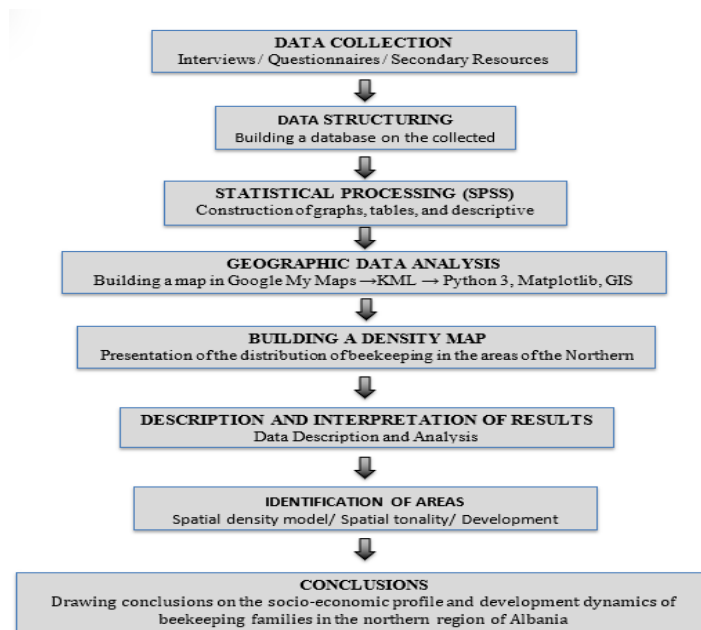


Figure 1
Schematic representation of the research process

3 Study results

3.1 Zonal territorial distribution of beekeeping

The northern region of Albania exhibits a heterogeneous distribution of beekeeping activity. This pattern has led to the formation of distinct micro-zones, reflected in local economic structures, social relations, and tourism development both within and beyond the region [16]. Micro-zones such as Theth and Tropojë represent areas with a high level of beekeeping development, while Pukë reflects a medium level of activity. In contrast, Fushë-Arrëz exhibits a significantly lower level of beekeeping development than leading micro-zones such as Theth. Other areas, including Koplik-Bajzë, Vermosh, Bogë, and Razëm, display relatively lower levels of beekeeping activity. This heterogeneous distribution contributes to differentiated micro-zoning patterns associated with natural biodiversity, local economic development, and tourism potential across the region.



Figure 2

Map of beekeeping activity in the northern region of Albania

3.2 Household Size and Beekeeping Participation

Based on data analysis and field observations, family involvement in beekeeping does not follow a linear relationship with family size. Large families with five members show approximately 27% lower involvement in beekeeping activities. The highest level of involvement was identified among two-member families, reaching 75%, followed by families with more than five members, at 42%. Families with an average number of members showed moderate involvement, specifically 33% in three-member families and 38% in four-member families. The collected data indicate that beekeeping in northern Albania is evident among both very small households, which tend to engage in this activity more intensively, and very large

families with more than five members. This pattern suggests a non-linear relationship between family size and participation in beekeeping activities [17]. The findings further suggest that family size influences the organization of labor and households' capacity to engage in beekeeping. Smaller families tend to show greater concentration and specialization in beekeeping activities, whereas larger families are more likely to diversify their economic activities, often in connection with tourism and other income-generating sectors [18].

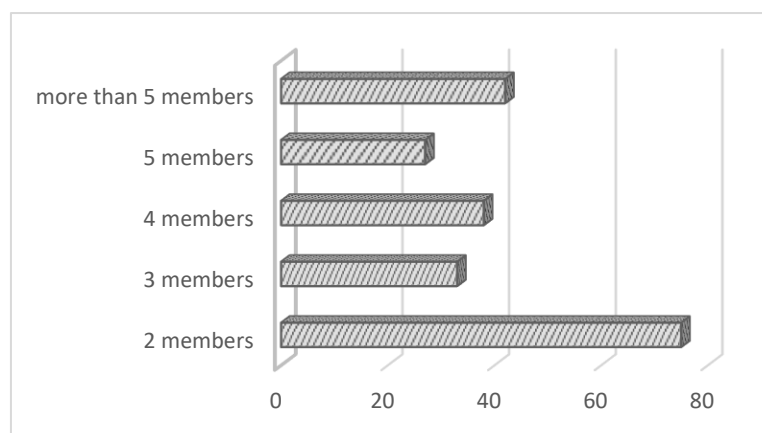


Figure 3
Beekeeping Involvement across Household Size Categories

3.3 The Role of Women in Beekeeping Households

Women play an important role in beekeeping households, where their participation contributes significantly to both family organization and economic activity. Gender dynamics within these households were analyzed in relation to family size and the female-to-male ratio. This ratio ranges from 0.58 to 0.65, with the lowest value observed in five-member households and the highest in three-member households. The findings indicate that women in smaller households, particularly in three-member families, tend to have a more prominent role in beekeeping activities. This level of involvement gradually decreases as family size increases. In larger households, the ratio remains at approximately 0.61 or higher. Overall, women in

small and medium-sized beekeeping families maintain a relatively balanced role, contributing both to household income and to local economic development [19].

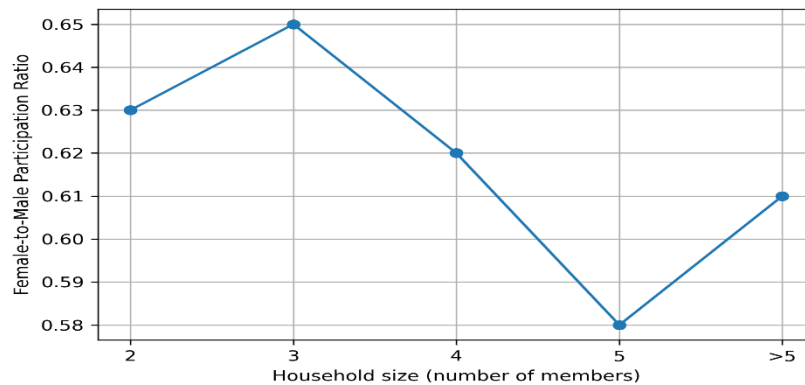


Figure 4
Female/male ratio of involvement in beekeeping by number of family members

3.4 Bee Production, Distribution, and Markets

Bee products, including honey, royal jelly, and propolis, are primarily produced to support local economic development and tourism activities. More than half of these products are sold to domestic and international tourists, as well as to guesthouses and tourism-related businesses. Approximately one quarter of beekeeping products are distributed through local markets, which remain a relatively limited sales channel. Only a small proportion of production is retained for household consumption by the producing families. Consequently, most beekeeping production is oriented toward meeting tourism-related demand, while the role of the local market remains comparatively limited [20]

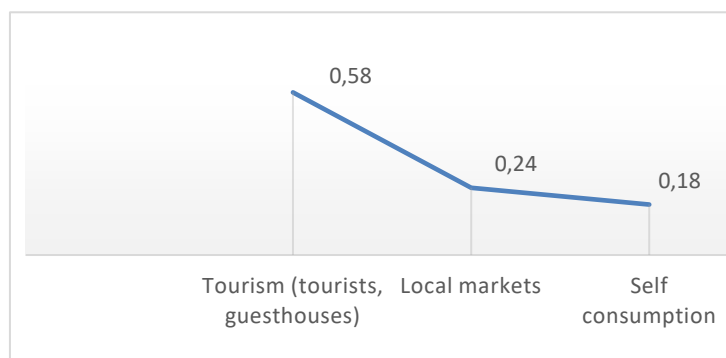


Figure 5
Beekeeping Product Distribution

3.5 Comparative Analysis of Beekeeping Training

Beekeeping has traditionally been passed down through generations in Albania, particularly in the northern regions, where traditional production methods continue to predominate. Although participation in professional training remains relatively low, Albania shows slightly higher levels of vocational engagement than Serbia, which records the lowest participation in professional beekeeping training in the regional comparison. Norway represents the highest level of participation, with more than half of its beekeepers involved in professional training programs that combine traditional knowledge with modern apicultural techniques. Croatia follows this trend, ranking above Albania and indicating an intermediate level of participation in professional training.

These comparisons indicate significant differences in the modernization and professionalization of beekeeping practices among countries. In northern Albania, signs of gradual progress in professional training are evident; however, traditional methods continue to dominate beekeeping practices. Available data indicate that approximately three-quarters of Albanian beekeepers continue to rely primarily on traditional methods [21].

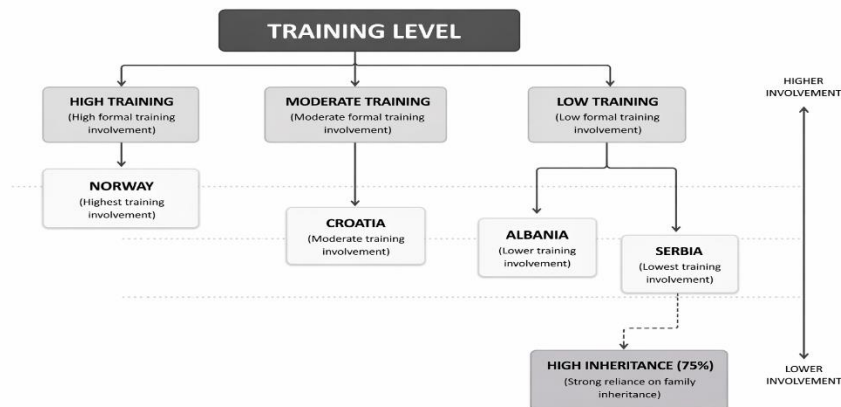


Figure 6

Distribution of Training and Traditional Knowledge in Beekeeping

4 Discussions

In conclusion, this research highlights the strong interconnection between environmental, socio-demographic, and economic factors influencing beekeeping families in northern Albania. Over time, these factors, together with local traditions, have gradually shaped and transformed rural beekeeping practices. Areas

characterized by rich biodiversity and favorable climatic conditions have contributed to the heterogeneous distribution of beekeeping activity, leading to the formation of distinct micro-zones across northern Albania [22]. This diversity reflects not only natural variations but also the influence of local and broader market dynamics. As a result, beekeeping has evolved from a traditional rural activity into an important socio-economic component of household livelihoods [23]. The findings also indicate that many beekeepers in northern Albania have not participated in professional training programs, limiting opportunities for modernization and alignment with international practices. At the same time, the socio-demographic diversity of beekeeping families highlights the need for stronger institutional support and more structured policy interventions. Such an integrated approach could improve family involvement in beekeeping and strengthen connections with local and wider financial markets. Greater attention should also be given to the inclusion of women in beekeeping through increased support from non-governmental organizations, development projects, and initiatives that promote successful female entrepreneurs. These measures could help strengthen gender equality and enhance the sector's long-term sustainability [24].

Conclusions

This study provides important insights into the socio-economic and socio-demographic profiles of beekeepers in northern Albania. The findings reveal a diverse micro-zonal territorial distribution shaped by natural conditions and the progressive development of beekeeping activities. Variations were observed in gender participation and family size within beekeeping households. Families with more than five members, as well as two-member households, demonstrated higher levels of engagement in beekeeping activities, while women's participation remains relatively limited and underutilized. Bee products are primarily oriented toward tourism-related markets, whereas consumption in local markets and household use remains comparatively limited. Although Albania continues to exhibit relatively low levels of professional training in apiculture compared with international standards, recent developments indicate gradual progress, underscoring the need for stronger institutional support and more innovative approaches to development. Overall, apiculture in northern Albania retains considerable potential for regional economic development and sustainable tourism, largely supported by longstanding traditions of family-based beekeeping.

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