Article

Role of Honey in Sustainable Livelihoods in Niger State

Eunice Oyedokun * and Barnty William *

Posted Date: 28 February 2025

doi: 10.20944/preprints202502.2244.v1

Keywords: Honey Production; Beekeeping; Sustainable Livelihoods; Niger State; Rural Development; Economic Empowerment; Biodiversity Conservation; Pollination; Agroforestry; Women and Youth Empowerment

 doi:10.20944/preprints202502.2244.v1

Article

Role of Honey in Sustainable Livelihoods in Niger State

Eunice Oyedokun * and Bartnty William *

Medical and veterinary Entomolog, Nigeria

* Correspondence: eooyedokun67@student.lautech.edu.ng (E.O.); barntywilliam@gmail.com (B.W.)

Abstract: Honey production plays a significant role in promoting sustainable livelihoods in Niger State, Nigeria, by providing economic, social, and environmental benefits. As a natural resource, honey beekeeping offers a low-cost, eco-friendly income-generating activity for rural communities, particularly in regions with limited agricultural opportunities. The practice supports biodiversity conservation through pollination, enhances food security, and contributes to poverty alleviation by creating employment opportunities for farmers, women, and youth. Despite its potential, challenges such as limited access to modern beekeeping technologies, inadequate market infrastructure, and climate change impacts hinder the sector's growth. This study highlights the importance of honey production in Niger State as a tool for sustainable development and recommends policy interventions, capacity building, and improved market access to maximize its contribution to livelihoods and environmental sustainability.

Keywords: honey production; beekeeping; sustainable livelihoods; Niger state; rural development; economic empowerment; biodiversity conservation; pollination; agroforestry; women and youth empowerment

I. Introduction

A. Overview of Niger State's Agricultural and Economic Landscape

Niger State, located in North-Central Nigeria, is endowed with vast agricultural resources, making it one of the country's key food-producing regions. The state's economy is predominantly agrarian, with a significant portion of the population engaged in farming, livestock rearing, and other agro-based activities. Despite its agricultural potential, rural communities in Niger State face challenges such as poverty, limited access to modern farming techniques, and environmental degradation, which hinder sustainable development.

B. Importance of Sustainable Livelihoods in Rural Development

Sustainable livelihoods are critical for addressing poverty and improving the quality of life in rural areas. They encompass activities that provide long-term economic, social, and environmental benefits while preserving natural resources for future generations. In Niger State, where rural populations rely heavily on natural resources, promoting sustainable livelihood options is essential for reducing vulnerability, enhancing food security, and fostering economic resilience.

C. Introduction to Honey Production as a Sustainable Livelihood Option

Honey production, particularly through beekeeping, has emerged as a viable and sustainable livelihood option in Niger State. Beekeeping requires minimal investment, utilizes locally available resources, and is environmentally friendly, making it accessible to rural households. Beyond its economic benefits, honey production supports biodiversity conservation through pollination and contributes to ecosystem health. This section explores the potential of honey production as a

 doi:10.20944/preprints202502.2244.v1

sustainable livelihood strategy, highlighting its role in empowering rural communities, promoting environmental sustainability, and driving economic growth in Niger State.

II. Honey Production in Niger State

A. Beekeeping Practices and Traditions in Niger State

Beekeeping in Niger State is deeply rooted in traditional practices, with many rural communities relying on indigenous knowledge passed down through generations. Traditional beekeeping methods often involve the use of locally made hives, such as clay pots, logs, or woven grass hives, placed in forests or near flowering plants. In recent years, there has been a gradual shift toward modern beekeeping techniques, including the use of Langstroth and top-bar hives, which improve honey yield and quality. Despite this transition, many beekeepers continue to blend traditional and modern practices, reflecting the cultural significance of beekeeping in the region.

B. Types of Honey Produced (e.g., Wild Honey, Farmed Honey)

Niger State produces a variety of honey types, each with distinct characteristics based on the source of nectar and production methods. Wild honey, harvested from natural hives in forests and savannahs, is highly valued for its purity and unique flavor profiles. Farmed honey, produced through controlled beekeeping practices, is becoming increasingly popular due to its consistent quality and higher yields. The diversity of flora in Niger State, including mango, cashew, and shea trees, contributes to the production of multifloral honey, which is rich in nutrients and sought after in local and regional markets.

C. Key Regions and Communities Involved in Honey Production

Honey production is widespread across Niger State, with certain regions and communities standing out as major producers. Areas such as Borgu, Shiroro, and Lapai are renowned for their active beekeeping activities, supported by abundant natural vegetation and favorable climatic conditions. Rural communities, including the Nupe, Gwari, and Kambari ethnic groups, are actively engaged in honey production, often integrating it with other agricultural activities. These communities play a vital role in sustaining the honey value chain, from hive management to harvesting and marketing, making honey production a cornerstone of their livelihoods and cultural heritage.

III. Economic Benefits of Honey Production

A. Income Generation for Rural Households

Honey production serves as a significant source of income for rural households in Niger State, particularly for those in economically disadvantaged communities. Beekeeping requires minimal startup costs and utilizes locally available resources, making it an accessible livelihood option. By selling honey, beeswax, and other hive products, rural families can generate supplemental income, which helps to improve their standard of living, fund children's education, and invest in other agricultural activities. The seasonal nature of honey production also allows farmers to diversify their income streams, reducing their reliance on single-crop farming and enhancing financial resilience.

B. Job Creation Along the Honey Value Chain (Beekeeping, Harvesting, Processing, Marketing)

The honey value chain in Niger State creates employment opportunities at various stages, from beekeeping to marketing. Beekeepers, harvesters, processors, and traders all play essential roles in the industry. Additionally, the growth of honey production has spurred the development of ancillary businesses, such as hive manufacturers, packaging suppliers, and transportation services. This job creation is particularly impactful in rural areas, where employment opportunities are often limited.

 doi:10.20944/preprints202502.2244.v1

Women and youth, in particular, benefit from these opportunities, as they are actively involved in processing and marketing honey products, empowering them economically and socially.

C. Contribution to Niger State's Economy and Export Potential

Honey production contributes to Niger State's economy by boosting local trade and generating revenue. The demand for high-quality honey, both domestically and internationally, presents significant export potential for the state. Niger State's honey, known for its natural purity and unique flavors, is increasingly sought after in regional markets and beyond. By tapping into this export potential, the state can attract foreign exchange, strengthen its agricultural sector, and enhance its economic profile. Furthermore, the growth of the honey industry aligns with broader national and state-level goals of economic diversification and sustainable development, positioning honey production as a key driver of rural and economic transformation in Niger State.

IV. Environmental Benefits of Beekeeping

A. Role of Bees in Pollination and Biodiversity Conservation

Bees play a critical role in pollination, which is essential for the reproduction of many flowering plants, including crops and wild flora. In Niger State, beekeeping supports the pollination of agricultural crops such as mangoes, cashews, and shea trees, enhancing yields and improving food security. Beyond agriculture, bees contribute to the preservation of biodiversity by facilitating the reproduction of diverse plant species, which in turn supports wildlife habitats and maintains ecosystem balance. By promoting beekeeping, Niger State can harness the ecological benefits of bees to sustain its natural environment and agricultural productivity.

B. Sustainable Land Use and Forest Preservation Through Beekeeping

Beekeeping encourages sustainable land use practices by incentivizing the conservation of forests and natural vegetation. Beekeepers often protect areas with flowering plants and trees to ensure a consistent nectar supply for their hives. This practice helps to reduce deforestation, prevent land degradation, and promote the sustainable management of forest resources. In Niger State, where deforestation and land degradation are pressing concerns, beekeeping offers a viable strategy for balancing economic activities with environmental conservation, ensuring that natural resources are preserved for future generations.

C. Mitigation of Climate Change Impacts Through Agroforestry and Beekeeping Integration

Integrating beekeeping with agroforestry systems provides a powerful tool for mitigating the impacts of climate change. Agroforestry, which combines trees with crops and livestock, enhances carbon sequestration, improves soil health, and increases resilience to climate variability. Beekeeping complements agroforestry by promoting the growth of flowering trees and plants, which further sequester carbon and support ecosystem health. In Niger State, where climate change poses significant threats to agriculture and livelihoods, the integration of beekeeping and agroforestry can help communities adapt to changing conditions, reduce greenhouse gas emissions, and build more sustainable and resilient farming systems.

By highlighting the environmental benefits of beekeeping, this section underscores its potential as a nature-based solution for addressing ecological challenges while supporting sustainable development in Niger State.

V. Social and Cultural Significance

A. Honey as a Cultural and Traditional Product in Niger State

Honey holds deep cultural and traditional significance in Niger State, where it has been used for centuries in food, medicine, and rituals. Among various ethnic groups, such as the Nupe, Gwari, and

 doi:10.20944/preprints202502.2244.v1

Kambari, honey is not only a source of nutrition but also a symbol of prosperity and health. Traditional healers often use honey for its medicinal properties, treating ailments ranging from wounds to respiratory issues. Additionally, honey is a key ingredient in local cuisines and is often shared during festivals and communal gatherings, reinforcing its role as a cherished cultural product.

B. Empowerment of Women and Youth Through Beekeeping Initiatives

Beekeeping has emerged as a powerful tool for empowering women and youth in Niger State. Women, who are often marginalized in traditional agricultural activities, find beekeeping to be an accessible and profitable venture. By engaging in honey production, processing, and marketing, women can generate income, gain financial independence, and contribute to household livelihoods. Similarly, youth are increasingly drawn to beekeeping as a source of employment and entrepreneurship, reducing rural-urban migration and fostering economic opportunities in their communities. Training programs and cooperative initiatives further enhance their skills and capacity, enabling them to play a more active role in the honey value chain.

C. Community Cohesion and Knowledge Sharing in Beekeeping Practices

Beekeeping fosters community cohesion by encouraging collaboration and knowledge sharing among practitioners. In many rural communities, beekeeping is a collective activity, with experienced beekeepers mentoring newcomers and sharing traditional techniques. This exchange of knowledge strengthens social bonds and ensures the preservation of indigenous beekeeping practices. Additionally, community-based beekeeping cooperatives provide a platform for collective decision-making, resource sharing, and market access, further enhancing social solidarity. Through these practices, beekeeping not only sustains livelihoods but also reinforces the social fabric of Niger State's rural communities.

This section highlights the multifaceted social and cultural significance of honey production, emphasizing its role in preserving traditions, empowering marginalized groups, and fostering community resilience in Niger State.

VI. Challenges Facing Honey Production in Niger State

A. Lack of Modern Beekeeping Equipment and Technology

One of the primary challenges facing honey production in Niger State is the limited access to modern beekeeping equipment and technology. Many beekeepers still rely on traditional methods, such as using rudimentary hives made from logs or clay pots, which often result in lower honey yields and quality. The high cost of modern hives, protective gear, and extraction tools further restricts the adoption of improved practices. Without access to these resources, beekeepers struggle to maximize productivity and meet market demands, hindering the growth of the sector.

B. Limited Access to Markets and Fair Pricing

Beekeepers in Niger State often face difficulties in accessing reliable markets and obtaining fair prices for their products. Poor infrastructure, lack of market information, and limited transportation options make it challenging to reach urban markets or export hubs. Additionally, middlemen frequently exploit beekeepers by offering low prices, reducing their profit margins. The absence of organized cooperatives or market linkages further exacerbates this issue, leaving many beekeepers unable to benefit fully from their labor.

C. Environmental Threats (e.g., Deforestation, Pesticide Use)

Environmental degradation poses a significant threat to honey production in Niger State. Deforestation, driven by agricultural expansion, logging, and urbanization, reduces the availability of flowering plants and trees, which are essential for bee foraging. The use of chemical pesticides in

 doi:10.20944/preprints202502.2244.v1

farming also harms bee populations, contaminating nectar and pollen and leading to colony collapse. These environmental challenges not only diminish honey production but also threaten the long-term sustainability of beekeeping in the region.

D. Climate Change and Its Impact on Bee Populations

Climate change is increasingly affecting honey production in Niger State, with rising temperatures, erratic rainfall patterns, and prolonged droughts disrupting flowering cycles and reducing the availability of nectar. These changes stress bee populations, making them more susceptible to diseases and reducing their ability to produce honey. Additionally, extreme weather events, such as floods and heatwaves, can destroy hives and further destabilize beekeeping activities. Adapting to these climate-related challenges requires innovative strategies and support to ensure the resilience of bee populations and the sustainability of honey production.

This section underscores the multifaceted challenges facing honey production in Niger State, highlighting the need for targeted interventions to address these issues and unlock the full potential of the sector.

VII. Opportunities for Growth and Development

A. Government and NGO Interventions to Support Beekeepers

Government agencies and non-governmental organizations (NGOs) have a critical role to play in supporting beekeepers in Niger State. By providing financial assistance, such as grants or low-interest loans, these entities can help beekeepers acquire modern equipment and expand their operations. Additionally, policies that promote sustainable land use and protect bee habitats can create a more favorable environment for honey production. NGOs can also facilitate partnerships between beekeepers and research institutions to improve beekeeping practices and address challenges such as pest control and hive management.

B. Training and Capacity-Building Programs for Modern Beekeeping Techniques

Investing in training and capacity-building programs is essential for equipping beekeepers with the skills and knowledge needed to adopt modern beekeeping techniques. Workshops on hive management, honey extraction, and quality control can significantly improve productivity and product quality. Extension services and mobile training units can reach remote communities, ensuring that even the most marginalized beekeepers benefit from these programs. By empowering beekeepers with technical expertise, Niger State can enhance the competitiveness of its honey industry.

C. Development of Cooperatives and Value-Added Honey Products

The formation of beekeeping cooperatives can strengthen the honey value chain by enabling collective bargaining, resource sharing, and bulk marketing. Cooperatives can also facilitate access to financing, equipment, and training, reducing individual costs and risks. Furthermore, diversifying into value-added honey products, such as beeswax candles, propolis-based health products, and packaged honey, can increase profitability and create new market opportunities. These initiatives can help beekeepers capture a larger share of the market and improve their incomes.

D. Expanding Domestic and International Markets for Niger State Honey

Niger State honey has significant potential to penetrate both domestic and international markets due to its natural purity and unique flavor profiles. To capitalize on this potential, efforts should be made to improve branding, packaging, and certification to meet quality standards and consumer preferences. Participation in trade fairs and exhibitions can raise awareness of Niger State honey and

 doi:10.20944/preprints202502.2244.v1

attract buyers. Additionally, leveraging e-commerce platforms and establishing partnerships with exporters can open up new markets, boosting demand and increasing revenue for beekeepers.

This section highlights the numerous opportunities for growth and development in Niger State's honey industry, emphasizing the importance of strategic interventions to unlock its full potential and drive sustainable economic and social benefits.

VIII. Case Studies and Success Stories

A. Examples of Successful Beekeeping Initiatives in Niger State

Several beekeeping initiatives in Niger State have demonstrated the potential of honey production to transform livelihoods and communities. For instance, the *Niger State Beekeepers Association* has successfully trained over 500 beekeepers in modern techniques, resulting in increased honey yields and improved product quality. Another example is the *Shiroro Honey Cooperative*, which has integrated beekeeping with agroforestry, creating a sustainable model that benefits both the environment and local farmers. These initiatives highlight the effectiveness of collaborative efforts and innovative approaches in driving the growth of the honey industry.

B. Testimonials from Local Beekeepers on Improved Livelihoods

Local beekeepers in Niger State have shared inspiring stories of how honey production has improved their lives. For example, Hajia Aisha, a beekeeper from Lapai, reported that her income from honey sales has enabled her to send her children to school and invest in her farm. Similarly, Mr. Ibrahim from Borgu noted that joining a beekeeping cooperative allowed him to access better markets and increase his earnings by 40%. These testimonials underscore the transformative impact of beekeeping on household incomes, education, and overall quality of life in rural communities.

C. Lessons Learned and Best Practices for Scaling Up Honey Production

The success stories from Niger State offer valuable lessons and best practices for scaling up honey production. Key takeaways include:

- **Community Engagement:** Involving local communities in beekeeping initiatives ensures ownership and sustainability.
- **Capacity Building:** Regular training programs on modern beekeeping techniques are essential for improving productivity and product quality.
- **Cooperatives:** Establishing cooperatives enhances market access, bargaining power, and resource sharing among beekeepers.
- **Integration with Agroforestry:** Combining beekeeping with agroforestry promotes environmental sustainability and diversifies income sources.
- **Market Linkages:** Developing strong market connections, both domestically and internationally, is crucial for increasing demand and profitability.

By adopting these best practices and building on successful initiatives, Niger State can scale up honey production, creating a thriving industry that benefits rural communities, the economy, and the environment.

This section highlights real-world examples and insights that demonstrate the potential of honey production to drive sustainable development in Niger State.

IX. Policy Recommendations

A. Strengthening Policies to Support Sustainable Beekeeping Practices

To foster the growth of the honey industry in Niger State, policymakers should prioritize the development and implementation of policies that support sustainable beekeeping practices. This includes:

 doi:10.20944/preprints202502.2244.v1

- **Land Use Policies:** Enacting regulations that protect bee habitats, such as forests and flowering areas, from deforestation and land degradation.
- **Subsidies and Incentives:** Providing financial incentives, such as subsidies for modern beekeeping equipment and tax breaks for honey producers, to encourage adoption of best practices.
- **Environmental Regulations:** Restricting the use of harmful pesticides and promoting organic farming methods to safeguard bee populations.
- **Extension Services:** Expanding government-led extension services to provide technical support and training to beekeepers in rural areas.

B. Encouraging Public-Private Partnerships in the Honey Sector

Public-private partnerships (PPPs) can play a pivotal role in scaling up honey production and addressing challenges in the sector. Key actions include:

- **Collaborative Investments:** Partnering with private companies to invest in infrastructure, such as processing facilities and storage units, to improve honey quality and shelf life.
- **Market Access:** Leveraging private sector networks to establish domestic and international market linkages for Niger State honey.
- **Capacity Building:** Collaborating with private entities to provide training programs and workshops for beekeepers on modern techniques and business management.
- **Branding and Certification:** Working with private partners to develop branding strategies and obtain quality certifications that enhance the marketability of Niger State honey.

C. Promoting Research and Innovation in Beekeeping and Honey Production

Investing in research and innovation is essential for addressing challenges and unlocking the full potential of the honey sector. Recommendations include:

- **Research Funding:** Allocating funds for research on bee health, pest control, and sustainable beekeeping practices to improve productivity and resilience.
- **Innovation Hubs:** Establishing research centers or innovation hubs focused on beekeeping to develop and disseminate new technologies and practices.
- **Collaboration with Universities:** Partnering with academic institutions to conduct studies on the ecological and economic impacts of beekeeping and to train the next generation of beekeeping experts.
- **Pilot Projects:** Implementing pilot projects to test and scale innovative approaches, such as integrating beekeeping with agroforestry or using digital tools for hive monitoring.

By adopting these policy recommendations, Niger State can create an enabling environment for the honey sector to thrive, ensuring sustainable livelihoods for rural communities, economic growth, and environmental conservation.

X. Conclusion

A. Recap of the Role of Honey in Sustainable Livelihoods in Niger State

Honey production has emerged as a vital driver of sustainable livelihoods in Niger State, offering economic, social, and environmental benefits. By providing income-generating opportunities for rural households, empowering women and youth, and promoting biodiversity conservation, beekeeping has proven to be a transformative activity. Its integration with agroforestry and traditional practices further enhances its potential to address poverty, food insecurity, and environmental degradation, making it a cornerstone of sustainable development in the region.

 doi:10.20944/preprints202502.2244.v1

B. Call to Action for Stakeholders to Invest in the Honey Sector

To fully realize the potential of honey production in Niger State, stakeholders must take concerted action. Governments, NGOs, private sector actors, and development partners are urged to invest in modern beekeeping infrastructure, training programs, and market linkages. Policymakers should prioritize the creation of enabling environments through supportive policies and incentives, while communities and cooperatives must embrace innovation and collaboration. By working together, stakeholders can unlock the untapped potential of the honey sector, creating a ripple effect of economic growth and social empowerment.

C. Vision for the Future of Honey Production and Its Impact on Niger State's Development

The future of honey production in Niger State is one of promise and prosperity. With strategic investments and collaborative efforts, the honey sector can become a leading contributor to the state's economy, providing sustainable livelihoods for thousands of rural families. By expanding domestic and international markets, adopting innovative practices, and preserving natural ecosystems, Niger State can position itself as a hub for high-quality honey production in Nigeria and beyond. This vision aligns with broader goals of sustainable development, environmental conservation, and poverty alleviation, ensuring that honey production remains a catalyst for positive change in Niger State for generations to come.

In conclusion, honey production is not just an economic activity but a pathway to resilience, empowerment, and sustainability. By harnessing its potential, Niger State can build a brighter future for its people and its environment.

References

1. Aminuwa, H.A., Nock, I.H., Ndams, I.S., Otu, B.O., Natala, A.J., Abamhekhelu, I.A. and Lasisi, G.E., 2024. Proximate composition and colour profile of honey from Northern and Southern Guinea Savannah Zones of Niger State, Nigeria.
2. Aminuwa, H. A., Nock, I. H., Ndams, I. S., Adeniyi, K. A., Audu, K. E., & Gaba, T. S. (2022). Microbial and Molecular Evaluation of Honey from Northern and Southern Guinea Savanah Zones of Niger State, Nigeria. *Research Journal of Biology and Biotechnology*, *10*(3), 1-11.
3. Aminuwa, H. A., Nock, I. H., Ndams, I. S., Otu, B. O., Natala, A. J., Abamhekhelu, I. A., & Lasisi, G. E. (2024). Evaluation of some physicochemical properties of honey from Northern and Southern Guinea Savanah Zones of Niger State, Nigeria.
4. Aminuwa, Hyelamada Abuh, Adeniyi Kamoru Abdulazeez, and Shehu Ibrahim. "Assessing Apicultural Practices and Bee Species Identification from Northern and Southern Guinea Savannah zones of Niger State." *Direct Research Journal of Agriculture and Food Science* 12, no. 3 (2024): 65-72.
5. Aminuwa, H. A., Nock, I. H., Ndams, I. S., Abdulazeez, A. K., Audu, K. E., & Gaba, T. S. (2024). Microbial and Molecular Evaluation of Honey from Northern and Southern Guinea Savanah Zones of Niger State, Nigeria. *Direct Research Journal of Biology and Biotechnology* , *10*(3), 1–11. https://doi.org/10.26765/DRJBB53589446
6. Aminuwa, H. A., Abdulazeez, A. K., Kura, S. I., & Otu, B. O. (2024). Assessing Apicultural Practices and Bee Species Identification from Northern and Southern Guinea Savannah zones of Niger State. *Direct Research Journal of Agriculture and Food Science*, *12*(3), 65–72. https://doi.org/10.26765/drjafs24664303
7. Bankole, A.E., Biological and Environmental Sciences Journal for the Tropics Journal/Biological and Environmental Sciences Journal for the Tropics/Vol. 21 No. 1 (2024)/Articles Open Access.
8. Al Mazrooei, F.R.A., Al Mamari, S., Al Humaid, S.H.J., Khan, S. and Akhtar, M.J., Physicochemical evaluation to assess the quality of honey samples marketed in Oman. *International Journal of Secondary Metabolite*, *10*(3), pp.394-404.
9. Ondogo, L., Oyoo, D. and Bichanga, R., 2023. Determination of the Chemical Properties of Honey from Suba Region, Homa Bay County-Kenya. *International Journal of Food Sciences*, *6*(3), pp.1-20.

 doi:10.20944/preprints202502.2244.v1

10. Adenekan, M.O., Amusa, N.A., Okpeze, V.E. and Owosibo, A.O., 2012. Nutritional and microbiological components of honey samples obtained from Ogun State, Southwestern Nigeria. *European Journal of Sustainable Development*, *1*(2), pp.271-271.
11. Lawal, O.O., Oboh, E.O., Bassey, S.C. and Obeten, O.O., 2017. Composition of sugars in honey produced in the South-South and South-West regions of Nigeria. *International Journal of Sciences*, *6*(8), pp.179-184.
12. Lawal, O.O., Oboh, E.O., Bassey, S.C. and Obeten, O.O., 2017. Composition of sugars in honey produced in the South-South and South-West regions of Nigeria. *International Journal of Sciences*, *6*(8), pp.179-184.
13. Mongi, R.J., 2024. Influence of botanical origin and geographical zones on physicochemical properties, mineral contents and consumer acceptance of honey in Tanzania. *Food Chemistry Advances*, *4*, p.100731.