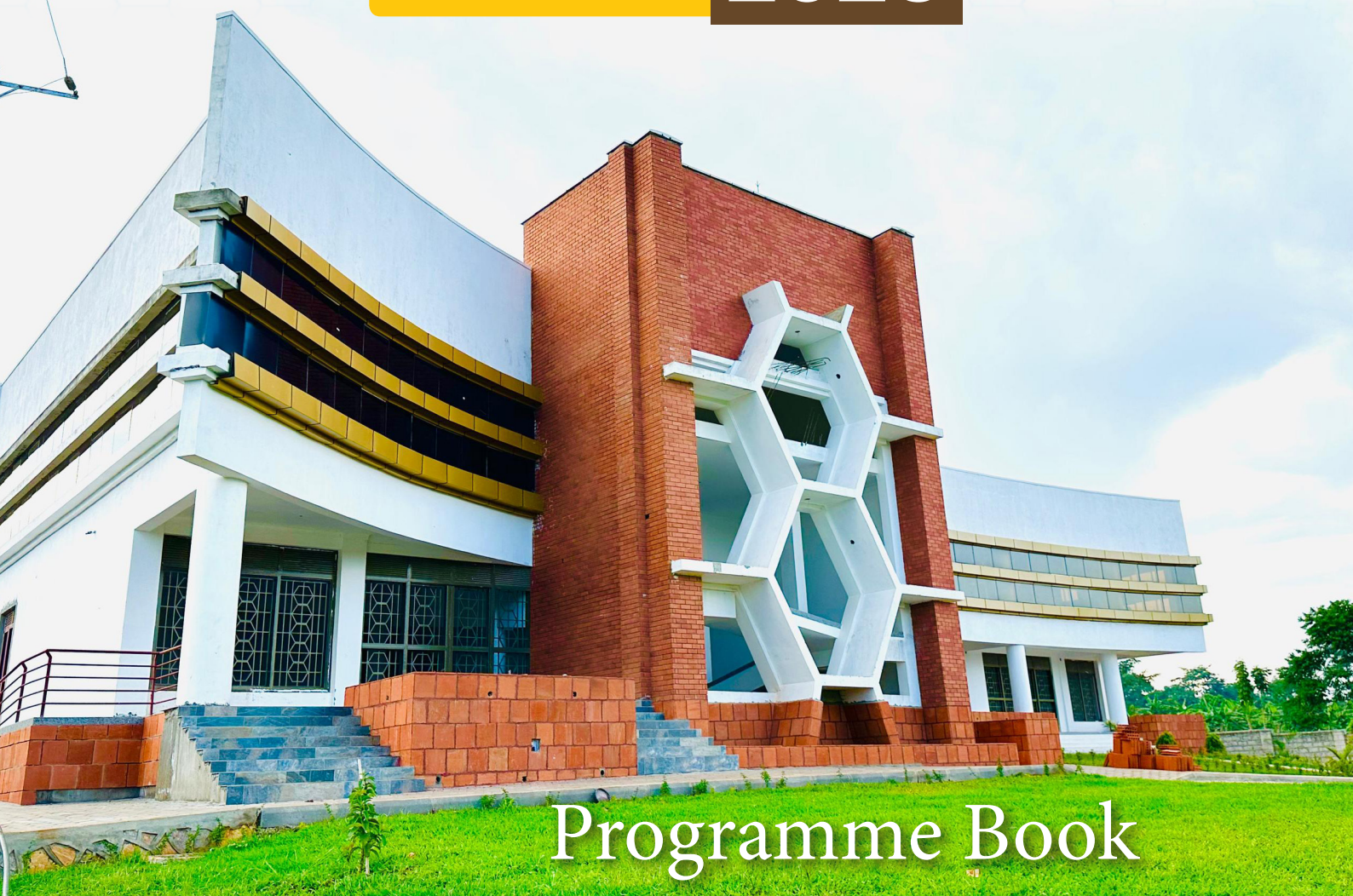




4TH AFRICA APIMONDIA SYMPOSIUM

BEEKEEPING FOR BUSINESS
AND LIVELIHOODS

2026



Programme Book



MAAIF
Ministry of Agriculture
Animal Industry and Fisheries



25TH - 28TH AUG
HOTEL AFRICANA

About Apimondia

The Apimondia Scientific Commission on Beekeeping for Rural Development sincerely thanks The Uganda National Apiculture Development Organisation (TUNADO) for the work done during the organisation of the 4th Africa Apimondia Symposium. We also extend our appreciation to the Government of Uganda, officials, speakers, delegates, sponsors, partners, exhibitors, volunteers, and all members of the organising and technical teams whose commitment made the Symposium a success. We value the knowledge shared, partnerships strengthened, and opportunities created to advance sustainable apiculture and rural development across Africa. We encourage all participants and apiculture stakeholders to keep the momentum going and join us in Dubai in 2027 for the Apimondia International Apicultural Congress. We look forward to welcoming you there!

Megan Denver



APIMONDIA
JUBILEE CONGRESS
DUBAI
UNITED ARAB EMIRATES | **2027**

15 - 19 NOVEMBER 2027

BEEKEEPING FOR THE FUTURE
EDUCATE | INNOVATE | SUSTAIN

SUSTAIN
From Margin to Mainstream
Arid-Land Beekeeping for a Climate-Changed World

EDUCATE
Resilience by Design
Heat-Adapted Genetics and the Future of Bee Stocks

SUSTAIN
The Integrity Economy
Honey Quality, Authenticity and the Economics of Trust

INNOVATE
The Intelligent Apiary
Technology, Data, New Uses for Bee Products and Next-Generation Beekeeping



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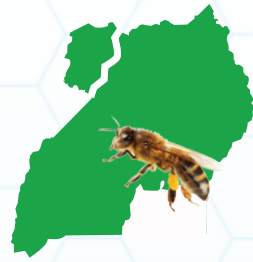


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**TUNADO***"Apiculture is business."*

Who we are

The Uganda National Apiculture Development Organisation (TUNADO) is the national body recognised by the public and the Government of Uganda to coordinate actors in the apiculture industry. TUNADO is a membership organisation uniting beekeepers, processors, packers, trainers, researchers, marketers, equipment manufacturers, development partners, government and all other stakeholders working towards apiculture development in Uganda.

TUNADO was formed after recognising that the apiculture sector was disorganised, yet held significant potential to contribute to rural household income, poverty reduction, national economic development and environmental conservation. A non-profit membership body incorporated as a company limited by guarantee (URSB Registration No. 62239) on 29 January 2004, TUNADO has since become the "must-go-to" institution for apiculture in Uganda.

By the end of 2025, TUNADO's membership had grown to 469 member organisations, comprising 154 corporate members, 156 community-based organisations and 159 individual members, representing more than 100,000 smallholder beekeepers nationwide, and it continues to grow.



TUNADO at a glance (2025)

- 469 member organisations
- 13,437 people reached directly and 83,210 indirectly in 2025
- 13 Rural Transformation Centres (RTCs) operational nationwide
- Beekeeping contributed an estimated UGX 240bn (≈ €55m) to the economy in 2025
- World of Bees (U) Ltd commercial arm — 4 retail outlets plus webshop (www.worldofbees.shop)
- Apiculture Business Fund portfolio of UGX 1.725bn; €1.3m export hub at Dundu (~95% complete)



Vision

A vibrant membership-based apex body coordinating the apiculture industry in Uganda for sustainable national development.



Mission

To provide a national platform for an inclusive, green apiculture sector through capacity building, lobbying and advocacy, market development, product and service diversification, and information sharing.



Philosophy

Apiculture is business



Core values

Membership-centred • Voluntarism • Accountability • Innovation • Inclusivity



Strategic objectives

- Influence inclusive apiculture policy and legal frameworks through evidence-based advocacy.
- Provide inclusive membership services through capacity building, market access, information sharing and financing.
- Promote nature-based solutions and models for sustainable apiculture development.
- Strengthen TUNADO as an inclusive and sustainable institution.



Governance & structure

The General Assembly is the supreme decision-making organ of TUNADO, comprising all paid-up members and convening annually within four months of the close of the financial year (1 January – 31 December). The Annual General Meeting receives the annual report, accounts and budget, appoints auditors and elects a nine-member Board with regional and value-chain representation.

The Board provides strategic direction and oversight and appoints management. The Management Team of 38 staff by the end of 2025 (10 management and 28 field extension personnel) is headed by the Executive Director, supported by a Programme Manager and a Finance and Administration Manager. The Board meets quarterly; management reports to it on status, achievements and planned actions. This clear separation of board and management roles, with consecutive unqualified audits, underpins TUNADO's reputation as a well-governed institution.



What we do

TUNADO coordinates and is the mouthpiece for all apiculture actors in Uganda. It organises multi-stakeholder platforms engaging government, private sector and development partners; advocates for favourable policies (standards, tax exemption, bee reserves, habitat restoration, agroforestry and responsible agrochemical use); facilitates market linkages along the value chain; runs promotion events such as National Honey Week; builds technical and governance capacity among members; fosters financial, youth and gender inclusion; and provides up-to-date apiculture information.

BOARD MEMBERS



Doreen Nsasiirwe Jean
South West
Vice Chairman



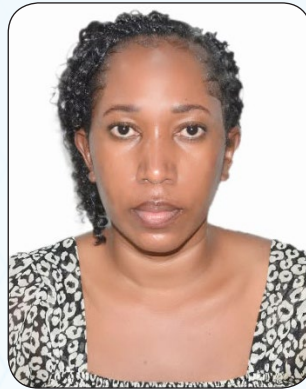
Prof. Robert Kajobe
West Nile
Chairman Board of Directors, TUNADO



Dr Dickson Biryomumaisho
Executive Director, TUNADO
Secretary to the Board



Alice Kangave
Co-opted



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Processors & Packers
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Board Member



Dr. Amulen Deborah Ruth
North East
Board Member

PROGRAMME

4th Africa Apimondia Symposium 2026

Uganda · 25–28 Aug 2026 · one room · 15-min slots · keynotes give two 30-min talks each (Impacts Lives: one) + a continental plenary · each keynote is woven into its theme session · 42 abstracts placed (37 oral + 5 posters).

DAY 1 — Tue 25 Aug	
TIME	SESSION / SPEAKER
09:00-09:15	Welcome and Host Remarks – TUNADO Chairperson, Prof. Robert Kajobe
09:15-09:30	Keynote Address from Apimondia – Apimondia Representative, Ms. Megan Denver
09:30-09:45	Remarks from the Ministry of Agriculture, Animal Industry and Fisheries – MAAIF Representative
09:45-10:15	Official Opening – Rt. Hon. Robinah Nabbanja, Prime Minister of the Republic of Uganda
10:15-10:30	PLENARY KEYNOTE — Strategic Plan for Beekeeping in Africa (David Mukomana)
10:30-11:00	BREAK — 30 min
11:00-11:30	KEYNOTE Pollination - Pesticide monitoring in Africa: From a honey bee-centric monitoring paradigm to an integrated, multi-taxon approach (Beatrice T. Nganso (PhD))
11:30-11:45	Masereka Yonah (Bulhalho Fdn) — Pollination-safe use of agrochemicals & alternatives
11:45-12:00	Arinda Apollo (Makerere) — Bee-safe organic pesticide for apiary-integrated systems
12:00-12:15	Souhaïbou Sawadogo et al. — Effects of agrochemical pesticides on Apis mellifera, Burkina Faso
12:15-12:30	Bonus Musiime — Choice Plus 2-in-1: pollinator-safe botanical bio-input
12:30-12:45	Bonus Musiime — Kacence Green Shield 2-in-1 organic pesticide
12:45-13:00	Baye Berihun et al. (BfD Ethiopia) — Pollination Training Toolkit: building govt capacity, Ethiopia
13:00-14:00	LUNCH — POSTER SESSION
14:00-14:15	Zewdie Abay et al. — Pesticide utilization & effects on honeybees, North Gonder, Ethiopia
14:15-14:30	Anne M. Akol (Makerere) — pollination value of honeybees in Robusta coffee
14:30-14:45	Arabang Mokokoane - Efficacy of bee idea in post radiotherapy hair regeneration
14:45-15:15	APIMONDIA KEYNOTE (1 of 2) — Stingless Bees as a livelihood catalyst - Beyond Honey: Stingless Bees Keeping as Drivers of Rural Incomes and Sustainable Development Orawan Duangphakdee) · via Zoom · 18:45–19:15 Bangkok
15:15-15:30	Krausa K. & Steyn W. (Beegreen, Tanzania) — Apitourism & melitourism for bee conservation
15:30-15:45	Kasangaki Patrice et al. (NaLIRRI) — Nutritional & antioxidant profiles of stingless-bee honey

15:45-16:00	Moses Chemurot et al. (NaLIRRI) — Stingless-bee honey & propolis for treating wounds & skin infections
16:00-16:30	BREAK — 30 min
16:30-17:00	APIMONDIA KEYNOTE (2 of 2) — Stingless Bees as a livelihood catalyst - Unlocking the Value of Stingless Bee Honey: Physicochemical Characteristics, Bioactive Compounds, and Global Market Opportunities (Orawan Duangphakdee) · via Zoom · 20:30–21:00 Bangkok
17:00-17:15	Mugume Ronald - Nesting Site and Altitude Shape Stingless Bee Species Distribution
17:15-17:30	Biryomumaisho Dickson et al. — Processors' practices & GC-MS quality of commercial propolis tinctures. Processors' capacity & adherence for quality propolis tincture

DAY 2 — Wed 26 Aug

TIME	SESSION / SPEAKER
09:00-09:30	APIMONDIA KEYNOTE (1 of 2) — Access to Export Market for Bee Products - Main Requirements of the International Honey Market (Norberto Luis Garcia)
09:30-09:45	Awad Hassan (Earth Intell) — Honey characterization to unlock SSA export markets
09:45-10:00	Agazhe Tsegaye (BfD, Ethiopia) — Unlocking Export Opportunities through Traceable Organic Honey: Lessons from Transform Project, Anderacha, Ethiopia
10:00-10:15	Chris Keywood (BfD) — Market access in rural landscapes, sub-Saharan Africa
10:15-10:30	Amena Dennis (TUNADO) — Market access for rural beekeepers, Karamoja (Busy Bees)
10:30-11:00	BREAK — 30 min
11:00-11:15	Phionah Birungi (TUNADO) — Enhancing Competitiveness and Market Access in the Beeswax Trade: Evidence from the Rwenzori Region of Uganda
11:15-11:30	Morut M. Isyagi & Dr Guy Ainsley — Beekeeping commercialisation & carbon-credit finance
11:30-11:45	Shingirirayi Mugabe (Pollinator Oasis, Zimbabwe) — Unlocking high-value bee-product markets (venom, royal jelly, pollen)
11:45-12:00	APIMONDIA KEYNOTE (2 of 2) — Access to Export - Regional Trends and Exportation Experiences in the International Honey Market (Norberto Luis Garcia)
12:00-12:15	APIMONDIA KEYNOTE — Beekeeping Impacts Lives - African Honey Trade: Opportunities and Impact for Livelihoods (Megan Denver)
12:15-12:30	Robert Mutisi (Working for Bees, Zimbabwe) — Beekeeping impacts lives: rural development study
12:30-12:45	Agwang Florence Hope (TUNADO) — twin-track disability-inclusive beekeeping
12:45-13:00	Moses Ssentamu (Hope for Justice) — beekeeping and child labour, Karamoja
13:00-14:00	LUNCH — POSTER SESSION
14:00-14:15	ASEU — Empowering sex workers through climate-smart apiculture
14:15-14:30	Jeff Pettis - Top bar vs frame vs log hives (via Zoom)
14:30-14:45	Ezera Mugenyi — Restoring Batwa indigenous livelihoods through beekeeping, Bwindi

14:45-15:00	Obina Richard (NAC Honey) — Affordable honey packaging to transform rural livelihoods
15:00-15:15	Papa Kwodwo Mbroha (BfD Ghana) — Strengthening rural livelihoods, biodiversity & resilience, Ghana
15:15-15:30	William Van Blyderveen (BfD) — Implementing impactful beekeeping projects: avoiding pitfalls
15:30-15:45	Ivan Ndyareeba (WWF Country Director)-For a living planet
15:45-16:00	Salim Kugonza (TUNADO) — physical inclusion and resilience
16:00-16:30	BREAK — 30 min
16:30-16:45	Aliganyira Nezaphoro (TRIAS EA) — economic opportunities for women and youth
16:45-17:00	Birungi Phionah (TUNADO) — GALS and women's triple role
17:00-17:15	Amulen D. R. et al. (Makerere) — Unlocking commercial potential of propolis: product dev & consumer validation
17:15-17:30	Tarinyeba Clarkson — Solar-powered bee-venom collector for apitherapy production

DAY 3 — Thu 27 Aug

TIME	SESSION / SPEAKER
09:00-09:30	APIMONDIA KEYNOTE — Back to Nature - Rethinking Modern Beekeeping: Are We Advancing the Practice or Constraining the Bees? (Prof Miguel Vilas Boas) · via Zoom · 07:00-07:30 Lisbon
09:30-09:45	William Van Blyderveen (BfD) — Nature-Based Beekeeping in practice: a global set of principles
09:45-10:00	Amena Dennis (TUNADO) — Agroforestry & beekeeping: coffee, FMNR & bees, Masaka
10:00-10:15	Papa Kwodwo Mbroha (BfD Ghana) — Fixed comb hive: underrated tool for livelihoods & biodiversity
10:15-10:30	Chris Keywood (BfD) — Conserving forests through rural beekeeping: satellite evidence
10:30-10:45	Tarinyeba Clarkson — HiveMover: movable/adjustable hive stand for beekeeper safety
10:45-11:00	Omisore Abideen (OAU) — Low-cost modifiable frame system for existing top-bar hives
11:00-11:15	Kwiringira J. & D. — Back to Nature: a global beekeeping innovation
11:15-11:30	Noureddine Adjlane — Health Note 2, Varroa destructor
11:30-11:45	Prof. Noureddine Adjlane — Health Note 1, honey bee welfare
11:45-13:00	TRAVEL TO TUNADO HOME/EXPORT HUB WITH UGANDA'S KAYOOLA BUS
13:00-14:00	LUNCH (Demos on weaving Kigezi traditional beehive and making a local smoker)
14:00-14:15	Welcome remarks from LCIII Chairman, Kyampisi Sub county
14:15-14:30	Dr. Dickson Biryomumaisho-About TUNADO
14:30-15:00	Dr. Kwiringira - "TUNADO@20: Documenting Two Decades of Transforming Uganda's Apiculture Sector"
15:00-16:00	Partners' panel (Shared Resource Centre-Woord en Daad; Heifer International; Bees for Development; Bwindi Mgahinga Conservation Trust; Oxfam; Trias EA)

16:00-16:30	BREAK — 30 min - Tree Planting
16:30-17:30	Entertainment by Ndere Troupe

DAY 4 — Fri 28 Aug

TIME	SESSION / SPEAKER
09:00-09:30	APIMONDIA KEYNOTE (1 of 2) — Venture into Apitherapy Business - Apitherapy Overview (Janos Kormendy-Racz) · via Zoom · 08:00–08:30 Budapest
09:30-09:45	Nakabugo I. & Amulen et al. (Makerere) — Bioactivity of Ugandan propolis: antioxidant & antimicrobial
09:45-10:00	Biryomumaisho Dickson et al. — Institutional framework & propolis-tincture processors' practices
10:00-10:30	APIMONDIA KEYNOTE (2 of 2) — Home use of Apitherapy (Janos Kormendy-Racz) · via Zoom · 08:00–08:30 Budapest
10:30-10:45	Linda & Ogaba - From Hive to Apitherapy Enterprise: A Ugandan Practitioner Case Study in Propolis Tincture Development
10:45-11:00	BREAK — 15 min
11:00-13:00	National Food Systems Policy Dialogue: Strengthening Governance for Sustainable, Resilient and Inclusive Food Systems in Uganda
13:00-14:00	LUNCH — POSTER SESSION
14:00-15:00	National Food Systems Policy Dialogue: Strengthening Governance for Sustainable, Resilient and Inclusive Food Systems in Uganda
15:00-15:15	Singing of the National and EAC Anthems
15:15-15:30	Keynote Address: The Future of Beekeeping in Uganda – Prof. Robert Kajobe
15:30-15:45	Nigeria's bid to host the 5th Africa Apiculture Apimondia Symposium-Yusuf Adeniyi Adeyemo
15:45-16:00	Four-Day Symposium Highlights and Key Outcomes-Dr. Narisi Mubangizi
16:00-16:30	Reflections on Apimondia and Rural Development – Ms. Megan Denver, Apimondia Rural Development
16:30-16:45	Reflections from MAAIF and the Apiculture Sector – Mr. Tusimomuhangi Lawrence, Commissioner, Entomology, MAAIF
16:45-17:30	Hon. Bright Rwamirama-State Minister for Animal Industry. Handing over awards. Delivery of closing speech

ABSTRACTS IN THEIR ORDER OF PRESENTATION

DAY 1

PESTICIDE MONITORING IN AFRICA: FROM A HONEY BEE-CENTRIC MONITORING PARADIGM TO AN INTEGRATED, MULTI-TAXON APPROACH

Author: Beatrice T. Nganso (PhD)

Abstract:

Pesticide contamination poses a major threat to managed and wild insect pollinators, with significant implications for agricultural productivity, biodiversity, and rural livelihoods. Social insects, particularly honey bees (*Apis mellifera*), are promising candidates for pesticide monitoring because of their ability to integrate contaminants across multiple environmental compartments. Here, we present a synthesis of the use of social insects in pesticide monitoring and risk assessment over the past decade, with particular emphasis on Africa within a global context. Our global review of more than 500 scientific studies shows that bees dominate pesticide monitoring research (94% of studies), with honey bees alone accounting for 81% of

bee studies, while other social insects remain largely overlooked. Despite rapid agricultural intensification and increasing pesticide use, Africa contributes only 11% of global studies. Furthermore, most studies have been conducted in agricultural and apicultural landscapes, often complemented by laboratory experiments designed to simulate field-realistic pesticide exposure within these landscapes. Our review highlights the continued value of honey bees in pesticide monitoring and proposes pathways to integrate broader pollinator taxa into pesticide monitoring frameworks to safeguard pollinator health, pollination services, and sustainable food production and livelihoods across Africa and beyond.

POLLINATION SAFE USE OF AGROCHEMICALS AND ALTERNATIVES

Pollination is essential for food production and healthy ecosystems, but the unsafe use of agrochemicals can harm bees and other pollinators. To protect pollination, farmers should use agrochemicals responsibly by applying them in the early morning or late evening when bees are less active. Spraying during flowering periods should be avoided, and recommended dosages and instructions must always be followed. Using targeted spraying methods instead of broadcasting chemicals also reduces risks to pollinators. Farmers are encouraged to adopt safer alternatives such as organic farming practices, biological pest control, and integrated pest management. These

methods include using natural predators, crop rotation, resistant crop varieties, and botanical pesticides like neem extracts. Planting flowering plants and maintaining hedgerows also support pollinator health. By promoting pollination-safe agrochemical use and adopting sustainable alternatives, farmers can protect bees, improve crop yields, conserve biodiversity, and ensure long-term agricultural productivity while safeguarding the environment and community livelihoods.

By Masereka Yonah
Executive Director, Bulhalho Foundation
info@bulhalhofoundation.org

REPORT ON AN ORGANIC PESTICIDE SAFE FOR USE AROUND APIARIES IN DIVERSE AGRICULTURAL SYSTEMS

Submitted by: Arinda Apollo
Student : Makerere University

Pollinators, particularly bees, are essential for agricultural productivity and ecosystem stability. However, their populations are increasingly threatened by harmful agrochemicals. This study aims to develop and evaluate a bee-safe organic pesticide suitable for use in apiary-integrated farming systems. The extensive use of synthetic pesticides in crop production contributes to bee mortality, reduced foraging efficiency, and contamination of hive products. These effects undermine pollination services, crop yields, and the economic viability of beekeeping. A plant-based pesticide was formulated using neem (*Azadirachta indica*), garlic, ash, chili, and ginger extracts combined with rabbit urine, tobacco leaves. Field trials will be conducted using a randomized complete block design with three treatments: organic

pesticide, synthetic pesticide, and control. Data were collected on pest incidence, bee activity, crop yield, and honey quality. The organic pesticide significantly reduces pest populations while maintaining bee health and activity. It lowers input costs and improved crop yields, demonstrating its effectiveness as a sustainable alternative to conventional pesticides. The innovation enhances colony survival, ensures production of chemical-free honey, and promotes integration of beekeeping with crop farming, thereby improving income and supporting climate-smart agriculture.

Keywords:

bee-safe pesticide, pollinator conservation, organic pest control, sustainable agriculture, beekeeping, integrated pest management

INVESTIGATING THE EFFECTS OF AGROCHEMICALS PESTICIDES ON *APIS MELLIFERA* UNDER LABORATORY AND SEMI-FIELD CONDITIONS IN BURKINA FASO

Authors: Souhaïbou SAWADOGO¹, Oswald Gilbert DINGTOUMDA¹, Hugues Roméo BAZIE², Modeste Florentin BATIONO³, Alexandre AEBI⁴, Antoine SANON¹, Zakaria ILBOUDO¹

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⁴University of Neuchâtel, Institutes of biology and anthropology, Laboratory of Soil Biology, rue Emile-Argand 11, 2000 Neuchâtel, Switzerland

Abstract

Honeybees are important allies in agriculture through their pollination services. Unfortunately, in providing this ecosystem service, they often become collateral victims due to their exposure to chemicals used to protect crops

against pests. Through laboratory and semi-field studies, we evaluated the effect of three main pesticides commonly used by farmers on honeybees in Burkina Faso. In the laboratory, we found that the insecticide, which contained the active ingredients acetamiprid (10 g/L) and

lambda-cyhalothrin (15 g/L), caused the death of 93% of adult bees 24 hours after ingestion. In the greenhouse, bee mortality increased sporadically the day after the prescribed dose was applied to crops. When excessive doses were used, an increase in mortality was observed on the days of spraying. At the same time, foragers were more abundant in treated crops than in those not exposed to pesticides (40.85 ± 8.23 vs. 12.4 ± 3.43 bees on day 12, $P < 0.001$). Among the dead bees we counted in the greenhouses where crops were treated with insecticide, there were adults as well as immature individuals

on the flight floor of the hives. These results are indicative of the risk of poisoning to which honeybees are exposed during their foraging activity. In a context where the use of synthetic pesticides seems to be becoming an integral part of the agricultural production cycle, with a tendency to disregard the prescribed doses, this study is intended as a plea to national authorities to promote sustainable agriculture.

Keywords: pollinators, glyphosate, neonicotinoids, mancozeb, *Apis mellifera*, Burkina Faso

CHOICE PLUS 2-IN-1. A POLLINATOR-SAFE BOTINICAL BIO – INPUT FOR SUSTAINABLE CROP PROTECTION AND SOIL REGENERATION

Author: Choice Musiime

Background

The extensive use of synthetic pesticides and inorganic fertilizers has negatively affected pollinator populations, soil fertility, and ecological balance within farming systems. Pollinators, especially bees, are essential for crop productivity and biodiversity conservation, yet they are increasingly threatened by agrochemical exposure. Smallholder farmers need affordable, eco-friendly alternatives that can control pests, improve soil fertility, and protect beneficial organisms. Choice Plus 2-in-1 was developed as a pollinator-safe botanical bio-input made from locally available organic materials to provide sustainable pest management and soil nourishment without harming bee life.

Innovation Description

Choice Plus 2-in-1 is an organic liquid formulation prepared through the fermentation of locally sourced materials including animal urine, *Phytolacca dodecandra*, *Tithonia diversifolia*, pawpaw leaves, tobacco, hot pepper, wandering jew, banana pseudostem, and other nutrient-rich organic substrates. These materials contain natural pesticidal compounds that repel or suppress crop pests, while also releasing plant nutrients that

improve soil fertility and stimulate crop growth. The formulation is biodegradable and designed to minimize toxicity to non-target beneficial organisms, especially pollinators. By replacing synthetic agrochemicals with plant-based and organic nutrient sources, the innovation promotes safer crop protection practices compatible with apiculture and biodiversity conservation.

Expected Impact on Productivity and Livelihoods

The use of Choice Plus 2-in-1 is expected to improve crop productivity by reducing pest damage while enhancing soil health through organic nutrient supplementation. Its pollinator-safe properties support healthier bee populations, leading to improved pollination services and increased honey production for farming communities engaged in apiculture. Because the product is made from accessible local materials, it offers a low-cost alternative to commercial agrochemicals and creates opportunities for local production and income generation. In the long term, Choice Plus 2-in-1 can strengthen sustainable agriculture systems by improving farmer livelihoods, conserving pollinator biodiversity, and reducing environmental contamination from synthetic farm inputs.

KACENCE GREEN SHIELD 2-IN-1 ORGANIC PESTICIDE: A BEE-FRIENDLY BOTANICAL SOLUTION FOR SUSTAINABLE CROP PROTECTION AND POLLINATOR CONSERVATION

Author: Bonus Musiime

Abstract

The increasing use of synthetic pesticides in agriculture has contributed to environmental pollution, reduced biodiversity, and significant losses of pollinators, particularly honey bees. Kacence Green Shield 2-in-1 Organic Pesticide was developed as a sustainable and eco-friendly alternative to conventional agrochemicals. The product is formulated from locally available botanical resources including *Tithonia diversifolia*, *Phytolacca dodecandra*, red pepper (*Capsicum* spp.), pawpaw leaves (*Carica papaya*), Mexican marigold (*Tagetes minuta*), and animal urine. These ingredients are naturally fermented for 21 days to enhance extraction of bioactive compounds with pesticidal and repellent properties.

The formulation provides dual action by controlling common crop pests while minimizing risks to beneficial insects, especially honey bees and other pollinators. Recommended application is 20 ml of Kacence Green Shield diluted in

20 litres of water, making it affordable and accessible for smallholder farmers. Preliminary field observations indicate improved crop health, reduced pest incidence, lower dependence on synthetic pesticides, and enhanced pollinator activity within treated farming systems.

This innovation promotes climate-smart agriculture, environmental conservation, and safe food production while utilizing locally sourced materials that can be produced by rural communities. The technology offers an opportunity for farmers to increase productivity without compromising ecosystem health and pollination services that are essential for food security.

Slogan: "Save Bees, Save Lives. Do not be farmers who spray poison on crops to control pests and later keep the same produce for human consumption. Choose bee-friendly solutions for a healthier future."

BUILDING GOVERNMENT CAPACITY TO PROMOTE POLLINATOR CONSERVATION AND IMPROVE CROP PRODUCTIVITY IN ETHIOPIA

Baye Berihun^{*1}, Atalo Belay², Koye Kassa³, Adane Tesfaye³, Janet Lowore⁴

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Pollinators play a critical role in crop productivity, biodiversity conservation, and food security, yet their importance remains insufficiently integrated into Ethiopia's agricultural extension system. This study presents the design, implementation, and evaluation of the Pollination Training Toolkit (PTT) Project (2024–2026), which aimed to strengthen government capacity and promote pollinator-friendly practices in Fogera, Libo-Kemkem (Amhara Region), and Chenchu (Southern Ethiopia). A mixed-methods approach was employed, combining participatory toolkit development, on-farm demonstration of

pollinator exclusion versus open pollination, a cascading Training of Trainers (ToT) model, and quasi-experimental evaluation using pre- and post-training assessments and comparisons between trained and untrained farmers. Results demonstrated clear yield and quality benefits of insect pollination, including a 48.3% increase in niger seed yield under open pollination, improved fruit set in avocado, and higher fruit weight in apple. A total of 35 trainers, 394 Development Agents (32% female), and 547 farmers (24.3% female) were trained. The proportion of Development Agents achieving high knowledge scores increased from 7.7% to

63.4%, while trained farmers scored significantly higher than untrained farmers across all knowledge domains. Evidence also indicated early adoption of pollinator-friendly practices, particularly in agrochemical management and habitat conservation. The participatory development of the PTT, combined with strong stakeholder engagement and alignment with government systems, facilitated institutional uptake, including integration into extension services and ongoing policy dialogue. The availability of the toolkit in local language and its delivery through a cascading model

enhanced scalability and sustainability. The study demonstrates that context-specific training tools, supported by experiential learning and institutional collaboration, can effectively improve knowledge, practices, and system-level integration of pollination services. Scaling up the PTT, strengthening its integration into extension curricula, and advancing policy support are recommended to sustain and expand impact.

Keywords: Pollination training toolkit, pollinators, pollinator friendly practice, capacity building

PESTICIDE UTILIZATION, PRACTICES AND THEIR EFFECT ON HONEYBEES IN NORTH GONDER, AMHARA REGION, ETHIOPIA

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Abstract

Pesticides are as good as improved seeds to maximize crop production when they are applied in the proper way. Consequently, the use of pesticides is increasing from time to time. This situation increased concerns about potentially adverse effects on honeybee health and the environment, particularly in countries where regulations are not strictly implemented and farmers' knowledge of safe handling procedures is often inadequate. This study was conducted in Chilga district, North Gonder to assess utilization, types and supply routes of pesticides. Quantitative and qualitative data were collected using semi structured questionnaires, key informant interview and Focus group discussions. A multistage sampling technique was used to select 353 respondents (155 beekeepers and 198 non-beekeepers), and a semi structure questionnaire was administered to the selected respondents. The results indicated a rapid increment in pesticide use regardless of its recent introduction of the district. Out of the ten different kinds of pesticides being used in the study area (2,4-D, Diazinon, Glycel, DDT,

mix of 2,4-D with Glycel, Mancozeb, Malathion, Endosulfan 35%, Dimethoate and Ethiosulfan 10%) 2,4-dichlorophenoxyacetic acid, glycel, diazinon and, Endosulfan 35% are the most widely used ones. Most of the farmers access these pesticides are illegal traders and are widely available in open market and shops. About 71.3% farmers had no access to advices, and 86.9% of them had no training on how to apply pesticides safely to themselves, to honeybees and to the environment. Furthermore, 87.2% of respondents applied pesticides without following the recommended instructions while 89% did not use protective clothes while spraying and applied pesticides on different crops during any time convenient to them. They keep left over pesticides at home and reuse empty pesticide containers for storing food items. In general, integrated efforts are needed to make farmers in Chilga district aware of their knowledge gap on the safe handling and utilization of pesticide including appropriate safety precautions.

Keywords: Honeybees, Pesticides, Pests, Pesticide use, Utilization

BEYOND BEEKEEPING; ANALYSIS OF THE POLLINATION VALUE OF HONEYBEES IN ROBUSTA COFFEE

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Background: Beekeeping has the potential to enhance food security and nutrition by way of pollination. In Uganda large scale farms of coffee, macadamia, Hass avocado and probably other crops often incorporate beekeeping in their production systems to secure optimal pollination and yields.

Problem: There is however very low awareness about the significance of pollination, in government and public circles. And yet, pollination services underpin the production of many of our crops. Thus, a study on the contribution of honeybees to yields of Robusta coffee was conducted to generate evidence on the economic value of bee pollinators to agricultural production.

Methodology: Pollination experiments were undertaken across 23 coffee gardens in central Uganda. In each garden, ten plants were randomly selected. One of six branches on each tree selected was assigned to one of six pollination treatments: open pollination; self-pollination, wind-pollination; pollination by a single bee; manual cross-pollination;

manual self-pollination. A single cluster of floral buds on each branch was the experimental unit.

Results and conclusion: Bee-mediated pollination significantly enhanced fruit set, reduced the proportion of pea berries and increased yields by 20-50%. Less than 5% of flowers per cluster produced berries where honeybees were excluded, implying a loss of \$5-10 per tree that could have been earned. The findings emphasize the value of bees in optimizing crop yields and household income.

Practical implications for beekeepers: Apiculture should be integrated into crop farming because it yields benefits for beekeepers and can serve as a pathway to encourage pollinator-friendly practices in agriculture. Cognisant that other types of bees can be superior to honeybees for pollination of certain crops, it is important to implement holistic measures for long-term conservation of all bees.

Keywords: *Apis mellifera*, *Coffea canephora*, household incomes, pollinators

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HEALTH NOTE No. 3

CLIMATE CHANGE AND AFRICAN HONEY BEE HEALTH

Climate adaptation: a strategic priority

Rising temperatures, prolonged droughts and changes in flowering patterns reduce colony nutrition, productivity and resilience. Climate change threatens pollination services essential for food security and biodiversity.

MULTIPLE CLIMATE PRESSURES AFFECTING COLONIES

HEAT STRESS High temperatures stress bees and reduce brood development.	DROUGHT Prolonged droughts limit nectar, pollen and water availability.	FLOWERING MISMATCH Changes in flowering times reduce colony nutrition.	WATER SHORTAGE Limited water affects bee thermoregulation and hive hygiene.	EXTREME EVENTS Fires, storms and floods destroy habitats and resources.	REDUCED FORAGE Lower availability of nectar and pollen weakens colonies.
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WHY CLIMATE ADAPTATION MATTERS

- Improves colony nutrition and immunity.
- Maintains pollination services.
- Supports honey and other hive products.
- Reduces vulnerability to diseases and pests.
- Helps reduce colony losses.

WHAT CAN BE DONE?

- Adopt climate-smart beekeeping practices.
- Restore and protect melliferous vegetation.
- Ensure water availability for colonies.
- Plant diverse and resilient forage species.
- Select and promote locally adapted bees.
- Monitor climate impacts on colonies.

KEY MESSAGE FOR AFRICA

Climate adaptation should become a core indicator of sustainable African apiculture.

APIMONDIA'S VISION

Building climate-resilient beekeeping systems that protect pollinators, biodiversity, food security and rural livelihoods across Africa.

CLIMATE RESILIENCE INDICATORS

Strong colonies	Continuous flowering	Diverse and abundant forage	Reliable water sources	Good productivity and honey yields
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HEALTH NOTE No. 4

HONEY BEE VIRUSES: A SILENT BUT MAJOR THREAT

Viruses associated with Varroa infestations are a major cause of honey bee colony losses. New sequencing technologies now enable improved detection and monitoring of viral infections.

MAIN VIRAL THREATS TO HONEY BEE COLONIES

DEFORMED WING VIRUS (DWV) Causes deformed wings and weak colonies.	ACUTE BEE PARALYSIS VIRUS (ABPV) Causes paralysis and high colony losses.	CHRONIC BEE PARALYSIS VIRUS (CBPV) Causes trembling, paralysis and colony decline.	BLACK QUEEN CELL VIRUS (BQCV) Affects queen development and colony performance.	VARROA-VIRUS INTERACTION Varroa mites spread and amplify viral infections.	HIDDEN INFECTIONS Many infections remain unnoticed without testing.
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WHY IT MATTERS

- Weakens bee colonies.
- Reduces bee lifespan.
- Causes queen failure.
- Leads to colony collapse.
- Increases economic losses for beekeepers.

WHAT CAN BE DONE?

- Strengthen diagnostic laboratories.
- Develop national and regional surveillance networks.
- Monitor and control Varroa infestations.
- Use molecular diagnostic tools.
- Share data and promote scientific cooperation.

KEY MESSAGE FOR AFRICA

Early detection and regional surveillance of bee viruses are essential to protect African apiculture.

APIMONDIA'S VISION

Developing coordinated African surveillance systems for emerging honey bee diseases, to ensure healthy colonies and sustainable beekeeping.

HEALTH INDICATORS FOR VIRAL CONTROL

Laboratory diagnosis available	Low Varroa infestation levels	Healthy queens	Strong and productive colonies	Functional surveillance network
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HEALTH NOTE No. 5

BEEKEEPING BIOSECURITY: THE FIRST LINE OF DEFENSE AGAINST DISEASES

Good beekeeping practices and biosecurity measures are the most effective tools to prevent the introduction and spread of diseases and pests. International surveys show that beekeepers need more training and technical support.

KEY BIOSECURITY MEASURES

CONTROL OF COLONY MOVEMENTS Avoid unnecessary movements of colonies. Comply with national regulations.	EQUIPMENT DISINFECTION Clean and disinfect hives, tools and protective gear regularly.	REGULAR INSPECTIONS Inspect colonies frequently to detect signs of diseases early.	HEALTHY QUEEN INTRODUCTION Use healthy, certified queens from reliable sources.	BEEKEEPER TRAINING Continuous training strengthens skills and promotes good practices.	EARLY DISEASE REPORTING Report suspected diseases promptly to veterinary authorities.
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WHY BIOSECURITY MATTERS

- Prevents the introduction and spread of diseases and pests.
- Protects healthy colonies and improves productivity.
- Reduces treatment costs and economic losses.
- Supports safe trade and hive movements.
- Strengthens the sustainability of apiculture.

WHAT CAN BE DONE?

- Develop and implement national biosecurity guidelines.
- Train and sensitize beekeepers at all levels.
- Strengthen extension services and technical support.
- Promote hive hygiene and good management practices.
- Improve disease reporting and surveillance systems.
- Regulate and monitor movement of bees and equipment.

KEY MESSAGE FOR AFRICA
Biosecurity should become a routine practice for every beekeeper in Africa.

APIMONDIA'S VISION
Creating a strong culture of biosecurity in African apiculture to protect bees, improve livelihoods and ensure the future of beekeeping.

BIOSECURITY INDICATORS

- Clean and well-maintained equipment
- Regular inspection records
- Healthy, strong colonies
- Controlled hive movements
- Trained and informed beekeepers

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HEALTH NOTE No. 7

AFRICAN HONEY BEES: A STRATEGIC GENETIC HERITAGE

African honey bees show strong adaptation to local conditions and remarkable resilience to multiple environmental stressors. Their conservation is a key issue for the future of global apiculture.

GENETIC STRENGTHS OF AFRICAN HONEY BEES

HIGH GENETIC DIVERSITY Rich genetic variation across African regions.	STRONG ADAPTATION TO LOCAL CONDITIONS Well adapted to local climates, flora and management systems.	DISEASE RESILIENCE Better natural resistance to many diseases and pests.	EFFICIENT FORAGING Excellent ability to exploit diverse and scattered resources.	CLIMATE RESILIENCE Tolerant to heat, drought and other environmental stresses.	BIODIVERSITY CONSERVATION A unique genetic heritage contributing to global biodiversity.
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WHY IT MATTERS

- Ensures long-term resilience of beekeeping in Africa.
- Enables adaptation to climate change.
- Supports sustainable breeding and improvement programs.
- Reduces colony losses and improves productivity.
- Protects a valuable global genetic resource.

WHAT CAN BE DONE?

- Characterize and monitor local honey bee populations.
- Conserve and protect native subspecies and habitats.
- Develop regional breeding and conservation programs.
- Promote exchange of genetic material and knowledge.
- Strengthen research and genetic databases.
- Support policy frameworks for genetic resource conservation.

KEY MESSAGE FOR AFRICA
Protecting African honey bee diversity is an investment in the future of global apiculture and food security.

APIMONDIA'S VISION
Safeguarding Africa's honey bee genetic heritage through science, collaboration and sustainable management for the benefit of present and future generations.

CONSERVATION AND GENETIC HERITAGE INDICATORS

- Genetic diversity maintained
- Healthy local bee populations
- Population characterization and monitoring
- Genetic databases and information systems
- Protected habitats and conservation areas
- Regional and international collaboration

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HEALTH NOTE No. 6

HONEY BEE HEALTH AND THE ONE HEALTH APPROACH

Honey bee health is now recognized as an integral part of the "One Health" approach, linking animal health, human health and ecosystem health. Protecting pollinators directly contributes to food security, biodiversity conservation and rural livelihoods.

ONE HEALTH CONNECTIONS

BEE HEALTH Healthy colonies ensure pollination and ecosystem services.	ECOSYSTEM HEALTH Bees support biodiversity and the balance of natural ecosystems.	FOOD SECURITY Pollination increases crop yields and improves food availability.	HUMAN HEALTH Nutritious food and clean ecosystems promote healthy communities.	RURAL LIVELIHOODS Beekeeping generates income and supports rural development.	SUSTAINABLE AGRICULTURE Bees enhance sustainable agriculture and reduce reliance on chemicals.
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WHY IT MATTERS

- Improves crop pollination and productivity.
- Conserves biodiversity and ecosystem services.
- Supports nutritious diets and better health.
- Strengthens climate resilience and ecosystem balance.
- Creates sustainable livelihoods for rural communities.

WHAT CAN BE DONE?

- Promote intersectoral collaboration.
- Protect pollinator habitats and biodiversity.
- Reduce pollution and pesticide risks.
- Support sustainable agriculture and land use.
- Raise public awareness on the value of pollinators.
- Strengthen research and data sharing.

KEY MESSAGE FOR AFRICA
Honey bee health should be integrated into national One Health strategies for a healthier and more resilient Africa.

APIMONDIA'S VISION
Positioning beekeeping as a strategic tool for One Health, driving sustainable development, biodiversity conservation and agricultural resilience in Africa.

ONE HEALTH INDICATORS

- Diverse and abundant pollinators
- Healthy ecosystems and habitats
- Strong and healthy colonies
- Sustainable food production
- Improved human well-being
- Cross-sector collaboration

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ARABANG MOKOKOANE - EFFICACY OF BEE IDEA IN POST RADIOTHERAPY HAIR REGENERATION

EFFICACY OF BEE IDEA HAIR SPRAY IN POST RADIOTHERAPY HAIR REGENERATION - A CASE STUDY

PRODUCT:
Bee hive byproduct; Hair care product

MANUFACTURER:
Nature Effect (Pty) Ltd

PRODUCT BRAND:
Bee Idea

APITOURISM AND MELIPONITOURISM, APPROACHES TO THE CONSERVATION OF BEES IN TANZANIA

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Tanzania boasts a rich and diverse beekeeping heritage, woven deeply into both rural livelihoods and the nation's natural landscapes. As one of the cornerstones of the country's economy, tourism is intersecting with beekeeping: apitourism. This emerging niche invites travellers to immerse themselves in the world of bees, offering unique experiences that range from witnessing hive-making to participating in honey harvesting and learning about sustainable beekeeping practices. In Tanzania, apitourism is not only focused on the popular honeybee (*Apis mellifera*), it also includes stingless bees (*Meliponini*).

The passive nature of stingless bees makes them a very suitable ambassador of the natural world. Without the dangers of getting stung, melitourism can be more than just an additional tourism product or a novel revenue stream for local communities—it is a powerful tool for education and conservation.

By opening beekeeping sites to visitors, apitourism/melitourism raises awareness about the crucial ecological role of bees, the challenges they face, and the importance of their preservation for both biodiversity and agriculture.

Currently, Tanzania features more than 20 apitourism/melitourism destinations welcoming both local and international tourists. Our talk will underscore the significance of establishing a robust network of apitourism/melitourism facilitators. Through collaboration and knowledge-sharing, such a network has the potential to strengthen the sector, support community development, and ensure that apitourism/melitourism remains a sustainable and beneficial approach for both people and pollinators.

Keywords: Melitourism, Apitourism, Value Chain, Education, Conservation, Sustainable Enterprise

NUTRITIONAL AND ANTIOXIDANT PROFILES OF STINGLESS BEE (*MELIPONULA BOCANDEI*) HONEY FROM TWO AGRO-ECOLOGICAL ZONES OF UGANDA

Kasangaki Patrice¹, Oromokoma Charles², Matovu Moses¹, Akite Perpetra², Patrick P'Odyek Abila¹, Mangusho Gilbert³, Mwanga Victor⁴, Agnes S. Otim¹ and Chemurot Moses¹

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Abstract

Stingless bees are social insects found throughout the tropical and subtropical regions of the world. In Uganda, the stingless bee, *Meliponula bocandei* (Spinola, 1853) was recently domesticated to increase sustainability of its honey and propolis harvesting. Here, the nutritional and antioxidant

properties of honey of this bee were analyzed. The honey was collected from the Western Highlands and Lake Victoria Crescent agro-ecological zones of Uganda. Results show varied ranges of the nutritional and antioxidant properties: sugar (50-76 mg/g), total phenolic compounds (7.21-95.38 gGAE/100g), total flavonoids (1.88-57.37

gCEQ/100g) and DPPH (2.07-18.04%). Minerals recorded in the honey included Phosphorus, Zinc, Calcium, Iron, Copper, Potassium, Manganese, Magnesium and Sodium. Phosphorus was the most abundant mineral element in the *M. bocandei* honey. Total phenolic compounds and DPPH were significantly higher in honey collected during the dry season compared to the wet season. However, *M. bocandei* honey collected during the wet season had a significantly higher total amount of flavonoids than that of the dry season. Lead and

Cadmium were detected in some honey samples. Therefore, the location of meliponaries should be carefully selected to minimize potential sources of heavy metal pollution while season when the honey is harvested affects the antioxidant properties.

Key words: antioxidants, minerals, flavonoids, Ugandan meliponiculture

Running head: Nutritional and antioxidant profiles of stingless bee honey

Topic: Stingless bees as a livelihood catalyst

STINGLESS BEE (*MELIPONULA BOCANDEI*) HONEY AND ETHANOL EXTRACTED PROPOLIS IN THE TREATMENT OF WOUNDS AND SKIN INFECTIONS

Moses Chemurot¹, Victor Mwanga², Charles Oromokoma³, Agnes S. Otim¹, Patrick Abila¹, Perpetra Akite³ and Patrice Kasangaki¹

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Abstract

Different communities across Uganda have used stingless bee honey and propolis as food and medicine since time immemorial. In order to ensure sustainable access to products from stingless bees, efforts to domesticate them in Uganda have been undertaken under the National Agricultural Research Organisation. The current study evaluated the potency of recently domesticated stingless bee (*Meliponula bocandei*) honey and ethanol extracted propolis (EEP) for treatment of wounds and skin infections respectively. Clinical trials were conducted at Dr. Ambrosoli Memorial Hospital Kalongo, Agago district in northern Uganda. The findings indicate that treatment of wounds and

skin infections using stingless bee products (honey and EEP respectively) showed positive response in the first three weeks compared to conventional antibiotics. Patients with skin infections who were treated using EEP took significantly shorter time to recover than those who were treated using anti-fungal clotrimazole cream. From this study, stingless bee products of *M. bocandei* have potential in wound and skin infections treatment.

Key words: apitherapy; beehive products; skin infections; wounds

Running head: Using stingless beehive products for treatment

Topic: Stingless bees as a livelihood catalyst

NESTING SITE AND ALTITUDE SHAPE STINGLESS BEE SPECIES DISTRIBUTION: IMPLICATIONS FOR SPECIES-SPECIFIC DOMESTICATION AND PRODUCTS IN BATWA COMMUNITY IN UGANDA

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Background:

Stingless bees (*melipona species*) are important for their role in primary health care through production of medicinal hive products such as honey, propolis and pollen and pollination of crops. The development of stingless bees for sustaining human livelihood is new and almost non-existent despite their presence in some African countries like Uganda.

Problem description:

Despite the significant importance of stingless bees in Uganda and beyond, information about nesting behavior, altitude effect and product yield is scanty in Uganda. This has made it difficult for farmers to domesticate stingless bees which is envisaged as a profitable enterprise in terms of food source and income generation. Here we show requisite evidence on nesting behavior, altitude and product yield in Batwa community that influence stingless bee domestication.

Methodology:

Hand held sweep nets were used to catch bees that were at takeoff. Direct manual collection, and measuring to determine the height, diameter and weight using a tape measure. R version 4.6.1 was used, Pearson's Chi-squared test was done to determine the effect of altitude and nesting sites.

Gaussian linear model was used to determine which stingless bee species have bigger volume of products.

Results and conclusions:

Findings show that (p-value = 0.006024) different stingless bee species dwell in different nesting sites and that altitude had a significant effect (p-value < 2.2e-16) on the species that dwell in it. Stingless bees' height and diameter for propolis were significant for all species while for honey and pollen were not significant. *Melipona nebulata* and *oguensis* propolis 'weight was significantly different. In conclusion, it is important to consider species and environment specific approaches to stingless bees' domestication and management.

Implications

The findings suggest that stingless bee domestication should be species and environment specific. Nesting site and altitude strongly influenced species distribution. Propolis characteristics also seem to have potential for distinguishing species and identifying differences in product yield.

Keywords: stingless bees, domesticate, species, products yield, Batwa

INFLUENCE OF THE INSTITUTIONAL FRAMEWORK ON THE PROCESSORS' PRACTICES FOR PROPOLIS TINCTURE PRODUCTION IN UGANDA

Dickson Biryomumaisho (PhD)

Propolis tincture, a growing medicinal bee product in Uganda, has attracted investors, but stakeholder practices and adherence to institutions remain unclear. A qualitative study consisting of focus group discussions with 22 purposively selected propolis tincture processors (PTPs) from Kampala, Lira, and Arua cities and key informant interviews with seven staff from government agencies responsible for apiculture regulation and support was conducted. The study found that processors rely on norms, beliefs, and a national beekeepers training and extension

manual, with little formal guidance. There is information asymmetry and poor coordination among agencies. Findings further revealed that PTPs believe that adherence is possible with guaranteed access to bigger markets, blocking entry of substandard goods on the market and simplification of certification processes. The study recommends developing formal specifications to complement informal norms.

Keywords: Institutional frameworks; propolis tincture; processors practices; beekeeping.

INFLUENCE OF PROCESSORS' CAPACITY ON ADHERENCE TO PRACTICES FOR QUALITY PROPOLIS TINCTURE PRODUCTION IN UGANDA

Dickson Biryomumaisho (PhD)

Propolis tincture (PT), a relatively new and rapidly marketed bee product in Uganda, has attracted investors; owing to its medicinal attributes and domestic uses. As a result of the increasing interest in PT commercialisation, there are concerns about the quality of PT in the marketplace; yet there are no specific standards. This study, therefore, sought to assess the capacity of processors and document their adherence to the specifications and considerations for producing quality PT in Uganda. To address this knowledge gap, a cross-sectional study undertaken, using qualitative and quantitative approaches. The survey involved a total of 124 respondents subjected to a face-to-face interview using a structured questionnaire in Kampala metropolitan, and Lira and Arua cities in Uganda. This was supplemented with three Focus Group Discussions (FGDs) and seven Key Informant

Interviews (KIs). Results showed PTPs had low capacity with moderate adherence levels ($P < 0.01$) to recommended practices. They used normative references (EAS 38, EAS 39, EAS 804) and National Beekeepers Training and Extension (NBTE) Manual to guide production. Availability of infrastructure, processing equipment, staff capacity building and human resource quality, influenced PTPs' adherence ($P < 0.01$), with 28.05 mean score out of 49 expected. The study recommends that actors and stakeholders in Uganda's apiculture subsector should support PTPs to build their capacity, based on a holistic understanding of the business environment in Uganda.

Keywords: Apiculture, beekeeping, normative reference

DAY 2

MAIN REQUIREMENTS OF THE INTERNATIONAL HONEY MARKET

Norberto García

Chairperson, Apimondia Commission on Beekeeping Economy

Honey is a natural product whose definition and composition criteria are well defined in internationally accepted standards and directives. However, some national standards are not completely aligned with international standards which can lead to products being traded under the same customs denomination but with different definitions and composition criteria.

According to the definition of honey by CODEX, honey sold as such shall not have added to it any food ingredient, nor any other foreign substance, hence honey cannot contain any objectionable matter, frequently referred to as “residues”.

Requirements for maximum residue levels or tolerances vary from market to market and even from contract to contract for the same importing country.

This presentation will review the main quality requirements of the most demanding markets

in terms of residue testing of honey, including potential contaminants derived from beekeeping practices and other contaminants coming from the environment where the bees forage.

Other important regulations regarding traceability and sanitary policies required by importers from the honey-producing country will also be reviewed.

Africa has many competitive advantages for honey production destined for export markets due to the existence of vast natural foraging areas for bees and a lower prevalence of some important bee diseases whose control normally involves the use of contaminating chemicals and the concomitant risk of appearance of residues in honey.

With adequate honey production protocols and certification schemes, a significant proportion of African honey could be produced and exported as organic to markets with the most demanding quality requirements.

FROM AFRICA TO THE WORLD: THE VITAL ROLE OF CHARACTERIZATION IN UNLOCKING EXPORT MARKETS FOR SUB-SAHARAN AFRICAN HONEYS

Awad Hassan (PhD)

Earth Intell, Egypt

Sub-Saharan Africa (SSA) hosts one of the most diverse apicultural landscapes on Earth, stretching from the arid savannas of the Sahel to the lush tropical rainforests of the Congo Basin. Moreover, honey produced largely under traditional, low-input systems is inherently organic and minimally processed, qualities increasingly demanded by premium international markets. Accessing those markets, however, hinges on rigorous

honey characterization: the systematic analysis of physicochemical, melissopalynological, and biological parameters. Such data underpin three pillars of international trade (i) compliance with importing-country standards, (ii) protection against adulteration, and (iii) the establishment of geographical indications and origin-based premium pricing. Yet published data on SSA honeys remain scarce and fragmented. This review synthesizes

the peer-reviewed literature, national and regional regulatory frameworks, and global trade statistics to determine the extent to which SSA honeys have been scientifically characterized, and how this knowledge gap shapes their export performance. The findings reveal a striking deficit: the majority of SSA honeys lack the physicochemical and

botanical descriptions required to enter regulated markets. Closing this gap will demand coordinated investment in laboratory capacity, harmonized regional standards, and dedicated characterization programs that link African research institutions to the global apicultural community.

UNLOCKING EXPORT OPPORTUNITIES THROUGH TRACEABLE ORGANIC HONEY: LESSONS FROM TRANSFORM PROJECT, ANDERACHA, ETHIOPIA

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Bees for development Ethiopia

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Abstract

Anderacha forest in the Southwest Ethiopia is part of the eastern afro-montane biodiversity hotspot where forest beekeeping is the principal income source of the community. Beekeepers own an average of 35 colonies, 79% of which are hanged on height trees and honey harvesting is done by mounting up and get back hives to the ground. Annual honey harvest is to be 700kg per beekeeper - 70% is from hives hanged on trees in the forest, have an annually income of 350,00Br ≈\$2,270 from honey sale. However, the forest was suffered from deforestation-a change to farm land as of no conservation value due to supply chain disruptions while beekeepers are less benefited. Beekeepers lack understanding of quality standards to access export market. On this logic, the "TRANSFORM" project has demonstrated honey quality assurance, traceability and organic certification to unlock premium export market using free survey tool Kobo Toolbox. The system has been kicked off since 2024 while cooperatives collected 7,871kg of honey through digital system involving 126 beekeepers and soled with an average price of 273 birr/kg. Likewise in 2025, performance increased notably, 10,879 kg were

collected—an increase of about 38% traceable honey. Honey price increased to 324 birr per kg and participation of beekeepers also grew from 126 to 176, reflecting stronger engagement in the value chain to apply the system using mobiles. Overall, across the two years, a total of 18,750 kg of honey was traded by 302 beekeepers through applying the system. The trend demonstrates improved quality, increased beekeepers participation, and better price—indicating they become strengthen in honey trade. Collected honey has been sold-out for the Green Face Trading PLC which is known to export organic honey to Europe. Furthermore, 517 beekeepers are entering to organic system under organic regulation EU 2018/848. Strong internal control system (ICS) has been established under a group certification model while capacity building trainings provided once a year on organic integrity. In conclusion, through traceability, organic certification and market connectivity, beekeepers are transforming from informal markets to premium export market—enhancing livelihoods while promoting environmental sustainability.

Key words: Export market, honey, organic certification, traceability

ACCESS TO MARKETS IN RURAL LANDSCAPES: A REVIEW OF CHALLENGES AND SUCCESSES FROM SUB-SAHARAN AFRICA

Chris Keywood¹

¹ Bees for Development Monmouth, UK

Topic: Access to Export Market for Bee Products
Oral Presentation

Abstract

Beekeeping is a viable income source for people from all walks of life. When done correctly everyone can become a beekeeper regardless of age, wealth, gender or disability.

All beekeepers need a place to sell their honey and other bee products. Rural beekeepers, especially those in sub-Saharan Africa, can often struggle to find a market large enough to support their subsistence needs while offering the opportunity for business growth. Without the knowledge or funds to conduct in depth market analyses, or the ability to travel to meet potential buyers, rural beekeepers often lack the means to access markets that will support large quantities of bee products, and this leaves beekeepers unable to grow their beekeeping into a viable business.

While market access is a complex and ever-

changing problem that is highly context specific, rural beekeepers are not left without options. Based on Bees for Development's experience and learning from over 30 years of supporting rural beekeepers' ability to gain access to reliable markets for their bee products, this review looks at some of the most common challenges affecting rural beekeepers and their constraints to growth and analyse the options available to them. Not every beekeepers will want to or be able to get their honey to an export market but for those who do, this review will also look at the proven solutions we have found that allow beekeepers to create sustainable market links and sell their bee products locally, regionally, nationally, and internationally and what it takes to grow from small-scale local producers into large scale exporters.

Keywords: exports, market access, rural beekeeping, market links, bee products, project learning

ENHANCING COMPETITIVENESS AND MARKET ACCESS IN THE BEESWAX TRADE: EVIDENCE FROM THE RWENZORI REGION OF UGANDA

Author(s): Birungi Phionah Organisation: The Uganda National Apiculture Development Organisation (TUNADO) Email: bphionah@tunadobees.org

Abstract

Beeswax is an important bee product with potential to contribute to value addition, rural livelihoods and commercial development in Uganda, but its trade is constrained by weak market targeting, limited technology adoption and cost inefficiencies. This study examined how market focus, innovation and cost leadership strategies influence beeswax trade performance in the Rwenzori region. A cross-sectional mixed-methods design was used. Data were collected through a structured survey involving 103 of

110 identified stakeholders, complemented by key informant interviews and document review. Business management strategies were examined through market focus (market research, customer relations and market expansion), innovation (technology adoption, staff training and resource allocation), and cost leadership (operational cost minimization, supply-chain optimization and production cost minimization). Multiple regression analysis showed that the three strategies jointly explained 71.7% of the variation in trade performance. Innovation had a significant positive

effect ($p=0.004$), while cost leadership had the strongest effect ($p<0.001$). Market focus was not significant ($p=0.315$), reflecting limited systematic market targeting and product positioning. The study concludes that affordable technology, skills development and cost-efficient operations are critical to competitiveness, while stronger market

intelligence, branding and customer engagement are needed to improve market access and support higher-value beeswax markets.

Keywords: Beeswax, business management, innovation, cost leadership, market access, value addition, Uganda.

REGIONAL TRENDS AND EXPORTATION EXPERIENCES IN THE INTERNATIONAL HONEY MARKET: IN SEARCH OF INSPIRATION MODELS FOR AFRICA.

Norberto García

Chairperson, Apimondia Commission on Beekeeping Economy

Honey fraud is probably the most relevant factor currently influencing the performance of honey producing and exporting countries or regions. Fraud threatens the economic sustainability of commercial beekeeping operations around the world and seriously limits the potential of beekeeping as a tool for economic development and poverty alleviation in developing countries.

This presentation will first provide market information regarding current global tendencies, regional peculiarities, and most relevant anomalies in the international honey market. While some historical honey producing countries are currently replacing domestic production with imports of cheap and non-authentic products, some formerly important honey-exporting countries are declining their export capacities, unable to compete in unfair markets.

However, even in this complex scenario, some successful models emerge that could inspire other countries whose beekeeping sectors are still to be developed.

All the available information describing the current situation of the honey market will be used to launch a discussion about the convenience of using positive experiences gathered from successful honey export models for the development of unique, sustainable and successful models of honey production and exportation from Africa.

Trade data used in this presentation is sourced from Trade Map of the International Trade Centre (<https://www.trademap.org/Index.aspx>).

ABSTRACT 2: ACCESS TO MARKET FOR RURAL BEEKEEPERS IN KARAMOJA: A CASE OF BUSY BEES HONEY COLLECTION CENTRE, NAKAPIRIPIT

Author: Amena Dennis

Rangelands in Uganda are well known for their presence of good trees and shrubs and Nakapiripit district is not an exception. Located in the North Eastern part of the country, Nakapiripit has very many drought resistant trees in its landscape

and most of these provide good forage for bees. This has promoted beekeeping to be among the sources of income for the dwellers. Common species of trees and shrubs in these rangelands include *Acacia spp*, *Tamarindus indica*, *Combretum*

spp and *Balanites Egyptica*. These trees and shrubs have supported beekeeping and as a result, Many beekeepers have sited their hives under these trees for years with technical support from TUNADO. This has also been possible due to funding support from partners such as OXFAM and as such, the farmers sell their hive products(comb honey and raw propolis) to the off-takers such as busy bee honey collection centre.

Using TUNADO's Rural Transformation Centre (RTC model), Busy bees honey centre has been playing a key role in the honey market systems of Nakapiripit by offtaking honey for over 400 farmers.

Because of difficulties in accessing market, the center serves as a honey bulking centre for the

farmers who rely on their bicycles, motorcycles and sometimes even donkeys(for those who hail from the neighbouring Amudat district) to bring comb honey to the collection centre. These are issued with records i.e weight, grade and price payable for the hive products delivered by the manager i.e Samson. A farmer leaves behind a phone number onto which their money is deposited within 2 weeks from the date of sale.

Samson has been relying on funds from his business and he was recently supported with a loan from the Apiculture Business fund(ABF), a fund run by World of Bees to enable him purchase more honey from the farmers, process it and sell it for a profit. This has helped him expand his business, while also helping to provide direct and easy market to the beekeepers in Nakapiripit and Amudat.

BEEKEEPING COMMERCIALISATION – THE PROCESS FLOW HARNESSING CARBON CREDITS FINANCE"

Morut Martin Isyagi, Lamomi Farm, Kiryandongo, Uganda, and Dr Guy Ainsley, UK

Background / purpose

Developing apiculture businesses and wider forest-based economies needs capital. The greater the scale and impact being sort, the more capital is needed. Organic investment capital generation by subsistence farmers is not a viable as it is precarious and low level. Debt is expensive as it carries high-cost interest and sector risk premiums.

Problem description

Problem 1. The value chain of apiculture is not well described or contextualised therefore not *commercially* explainable to investors.

Problem 2. Low investment capital suppresses the sector's development meaning it is off mainstream investment landscapes.

Problem 3. Many stakeholders remain at the subsistence level, despite being skilled, as they cannot access and then leverage capital. This suppresses their security, ability to improve processes, and quality.

Problem 4. Inter-relationships between apiculture

and wider forest-based economies are not well *commercially* described so current values are depressed and potential values opaque.

Methodology

Through workshops, site visits, interviews, and desk research, an integrated process and value flow design was developed with three components.

Apiculture Value Chain.

A developed, expanded diagram using the well-established Porter's Value Chain to describe the primary and support functions covering; actions and how they are linked, where capital is deployed, and how value is created and consumed in a commercial apiculture business model.

Business Model Robustness checklist.

A simple checklist covering five areas that question business model dependencies and complexities that create and / or disperse viability, sustainability, and scalability risks.

Process and Quality Philosophy.

An adapted version of the high-level Toyota Way model to champion “people” and “continuous improvement”. A “well begun is half done” mindset.

Results and conclusions

All three components are developed and critiqued but not deployed on a live case.

All three could be trained from at this stage and applied to existing apiculture value chains.

Action research opportunities are sought.

Practical implications

- Better apiculture business model design and outcomes.
- Reduced risk for participants.
- Increased investor interest means better, lower cost capital including micro-capital.
- Wider scale investment opportunities including carbon credits to increase the value of forest-based economies.

Key words

Value chain, business model, quality, capital, commercial, investment.

UNLOCKING HIGH-VALUE BEE PRODUCT MARKETS FOR SUSTAINABLE BUSINESS GROWTH AND LIVELIHOOD DEVELOPMENT IN ZIMBABWE

Author: Shingirayi Mugabe
Organisation: The Pollinator Oasis

Beekeeping holds immense potential to drive rural livelihoods, biodiversity conservation, and agricultural productivity in Zimbabwe. However, despite favorable environmental conditions and surging global demand for diverse apiculture derivatives, Zimbabwe’s sector remains fragmented and restricted to conventional honey production. Concurrently, international markets for high-value derivatives—such as bee venom, royal jelly, and bee pollen—are expanding rapidly, offering lucrative pathways for income diversification. This study investigates the systemic barriers limiting Zimbabwe’s participation in these emerging markets and identifies strategic frameworks to transition the sector toward commercial viability.

A comparative value-chain analysis was conducted, benchmarking Zimbabwe against regional peers including Ethiopia, Kenya, and South Africa, supplemented by an evaluation of export market protocols, regulatory frameworks, and climate-risk data.

The findings indicate that Zimbabwe’s export readiness is constrained by weak institutional coordination, absent quality-assurance frameworks, limited specialized testing infrastructure, and poor traceability systems. These structural deficits are further compounded by climate-induced forage volatility. Conversely, regional models demonstrate that robust producer aggregation coupled with targeted technology adoption allows for successful diversification.

The study concludes that transforming Zimbabwe’s apiculture from a single-product honey industry into a diversified, tech-enabled business model—incorporating specialized derivatives, queen rearing, and commercial pollination services—is vital for rural economic resilience. Realizing this requires strategic investment in localized certification pipelines, circular production practices, and structured smallholder aggregation hubs to secure strict international compliance and unlock sustainable regional growth.

AFRICAN HONEY TRADE: OPPORTUNITIES AND IMPACT FOR LIVELIHOODS

Megan Denver

Chairperson, Apimondia Commission on Beekeeping for Rural Development

In collaboration with Norberto Garcia

Chairperson, Apimondia Commission on Economy

I want to look at what the honey trade figures tell us about beekeeping in Sub-Saharan Africa and what they may mean for beekeepers and their livelihoods.

Africa imported just over 17,000 tons of honey in 2025, and 83 per cent came from outside the continent. The lowest-priced imports, from China, reached Sub-Saharan buyers at around \$1,424 a ton in 2024, compared with roughly \$2,100 for Indian honey. Those are difficult prices for African beekeepers to compete with. South Africa gives one example of that pressure: it has a strong commercial beekeeping sector, yet now imports around two and a half times what it produces.

Tanzania offers a different picture. Investment in residue monitoring and EU listing has helped it reach European buyers at about \$2,835 a ton, while African importers recorded 1,531 tons of Tanzanian

honey arriving in 2025, the largest African-origin flow on the continent. This suggests export growth and regional trade can develop alongside each other.

Uganda already has the same EU listing and is achieving a higher price per ton than Tanzania. The next opportunity is to build volume. That depends on more beekeepers being able to participate, including women, young people and people with disabilities, for whom beekeeping can offer a livelihood with relatively little land or capital.

Figures are drawn from ITC Trade Map. Some are reported by the trading partner rather than by the country itself. Tanzania's own customs record a considerably smaller export volume, and the unit prices are exporter-declared. The figures are therefore most useful for understanding direction and scale rather than exact quantities.

BEEKEEPING IMPACTS LIVES-ORAL PRESENTATION

Robert Mutisi - LEAD DIRECTOR, Working for Bees (Pvt) Ltd- Zimbabwe, Bees for Development Project
Director in Zimbabwe and Team Lead for African Beekeeping systems working group.

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Abstract

When thinking about Rural Development initiatives, beekeeping comes top on the list. Rural development is about changing people's lives. Globally beekeeping has been considered as an initiative that contributes significantly towards achieving the United Nations Sustainable Development Goals. Even with these important contributions Beekeeping is attached to, many people are still not aware of the impact it brings to people's lives. This gap prompted the study that sought to establish the life-changing impacts of beekeeping manifested in

several keyways. The study used questionnaires, structured interviews and observations as tools to generate data. The mixed method approach was used to collect and analyze data, this eliminated data gaps. 30 experienced beekeepers were drawn from five wards, took part in the study. 15 women and 15 men chosen purposively participated. The study established that beekeeping impacts lives through economic empowerment, agricultural yield improvement, poverty alleviation and social welfare, environmental conservation and climate resilience, Support for women and youths and skills

development.

In conclusion, beekeeping has a great potential to deeply impact lives through the provision of reliable drought resistant income source, empowering vulnerable groups and boosting agricultural crop yields through pollination. Government policies to

be supportive of the efforts of beekeepers as they thrive to use low-cost hives to deeply impact lives.

Key words: Rural Development, environmental conservation, climate resilience, beekeeping, pollination

THE TWIN-TRACK APPROACH TO DISABILITY-INCLUSIVE BEEKEEPING PROGRAMMES: POLICY AND PRACTICE LESSONS FROM UGANDA.

Mode of Presentation: Oral.
By Agwang Florence Hope

The Uganda National Apiculture Development Organisation (TUNADO), Bees for Development (BfD) and other partners have over the past 8 years implemented targeted measures to support the participation of persons with disabilities (PwDs) in beekeeping. Guided by the principles of the UN disability inclusion strategy, this paper shares a practical model that has been used for operationalising the twin-track approach to disability inclusion within beekeeping programmes and organisations.

Despite growing global commitments to disability inclusion, PwDs continue to face significant barriers to participation in the apiculture value chain. There is growing recognition for the need for disability inclusion, but as a cross-cutting issue; practical guidance on how to translate policy commitments into implementation remains limited.

The first component of the twin-track approach involves mainstreaming disability into project planning, budgeting and adopting inclusion as a shared organisational responsibility rather than a stand-alone intervention. The second component highlights practical ways of addressing specific barriers faced by PwDs by merging leadership commitment, dedicated inclusion budgets and activities.

This experience demonstrates that disability-inclusive approaches not only expand access to beekeeping opportunities but also illustrates that disability inclusion is achievable when organisations move beyond project-based approaches, adopt institution-wide systems for inclusion while ensuring that persons with disabilities participate as active contributors and leaders within the beekeeping value chain.

BEEKEEPING AS A CATALYST FOR REDUCING CHILD LABOUR AND STRENGTHENING RURAL LIVELIHOODS IN KARAMOJA, UGANDA

Implemented under the Protection and Restoration of Exploited Children (PREC) project. Funder: European Union (EU); Lead applicant: Woord en Daad; Implementing partners: Hope for Justice and The Uganda National Apiculture Development Organisation (TUNADO).

Abstract

Background: Exploitative child labour in Karamoja, Uganda, is closely tied to poverty, food insecurity and limited livelihood options, yet evidence on whether beekeeping can offer a

sustainable alternative remains scarce. Under the Protection and Restoration of Exploited Children (PREC) project (2023-2026), beekeeping and block farming were integrated with community-based child protection and social behaviour change

interventions to give vulnerable households viable income alternatives.

Methods: A quantitative midterm assessment (February to March 2025) surveyed 426 households across Abim, Kotido and Napak districts, comparing baseline and midline data on economic status, food security, education and child protection using structured household questionnaires and vulnerability assessment tools.

Results: Household resilience improved markedly. Severe food insecurity declined, and households accessing at least three meals per day rose from 1% to 19%. Children's contribution to household

income halved, while households reporting no school attendance fell from 68% to 37.8%.

Conclusion: Combined with positive parenting and child protection awareness, beekeeping offers a low cost, environmentally sustainable livelihood that reduces reliance on exploitative child labour and supports ethical, child labour free honey value chains. The multistakeholder partnership underscores the value of collaboration in addressing the root causes of child labour.

Keywords: beekeeping; child labour; rural livelihoods; food security; Karamoja; child protection

EMPOWERING SEX WORKERS THROUGH APIARY SUPPORT EASTERN UGANDA (ASEU)

Author: Maltina Nabeta

Beekeeping offers more than honey; it provides dignity, resilience, and sustainable livelihoods. Apiary Support Eastern Uganda (ASEU) pioneered a unique project that empowers sex workers through climate-smart apiculture. This project examined bee keeping as a tool for social and economic transformation among sex workers.

Through training, mentorship, and practical hive management, participants gained skills that generated new income streams and fostered self-reliance. The initiative not only improved financial stability but also reduced stigma and strengthened community acceptance.

BEEKEEPING FOR LIVELIHOODS AND CONSERVATION: A COMMUNITY-LED BATWA INITIATIVE IN BWINDI, UGANDA

Presenter: Ezera Mugenyi

Organizations & Partners: Africa Conservation Program (ACP) & Bwindi Batwa Culture Rock and Cave Association (BBCRCA): <https://africaconservationprogram.org/>

The Batwa Indigenous community living around Bwindi Impenetrable Forest in southwestern Uganda faces persistent livelihood challenges following displacement from their ancestral forest

lands. Limited access to land, employment, and sustainable income opportunities has increased vulnerability among Batwa households.

Sustainable beekeeping presents a culturally appropriate, environmentally friendly livelihood option that supports both community development and conservation.

UNLOCKING EXPORT POTENTIAL THROUGH SACHET HONEY PACKAGING INNOVATION IN UGANDA

Prepared by Obina Richard, obinarichard7@gmail.com



Uganda's honey sector has significant export potential; however, limited value addition and inconsistent packaging standards constrain access to regional and international markets.

This study investigates how sachet-based honey packaging can enhance product standardization, competitiveness, and entry into structured export channels.

STRENGTHENING RURAL LIVELIHOODS, BIODIVERSITY CONSERVATION, AND COMMUNITY RESILIENCE THROUGH BEEKEEPING IN GHANA

Author: Papa Kwodwo Mbroh^a
Affiliation: ^aBees for Development Ghana

Key Words: sustainable beekeeping, biodiversity conservation, livelihoods, social inclusion

improve livelihoods, strengthen climate-resilience, and encourage environmental conservation.

Background/Purpose

Beekeeping has emerged as a practical and sustainable livelihood strategy that contributes to rural development while supporting biodiversity conservation and ecosystem health. Since 2018, Bees for Development Ghana has worked with smallholder farmers and rural households across Ghana to promote sustainable beekeeping as a tool for poverty reduction, environmental stewardship, and community empowerment. This paper examines how community-based beekeeping interventions can simultaneously

Problem Description

Many rural communities in Ghana face persistent poverty, limited livelihood opportunities, and increasing environmental degradation driven by activities such as indiscriminate tree felling (timber and charcoal) and bush-burning. While communities are encouraged to conserve natural resources, weak land and tree tenure systems often prevent local people from directly benefiting from conservation efforts. The paper explores whether beekeeping can provide a viable incentive for both livelihood improvement and biodiversity

conservation, while identifying barriers that may limit long-term sustainability.

Methodology

The paper draws on experiences and lessons from community-based beekeeping interventions implemented by Bees for Development Ghana between 2018 and 2025. The approach combined technical training in sustainable beekeeping, creating market access, tree planting promotion and habitat conservation, and community-based natural resource management. Data and observations from project communities were used to assess changes in livelihoods, environmental stewardship, and social inclusion among participating households.

Results and Conclusion

The interventions enabled participating households to diversify income through the sale of honey, and beeswax, reducing dependence on environmentally destructive livelihood practices. Communities reported increased awareness of environmental conservation, while tree planting and habitat protection activities contributed to ecosystem restoration and improved forage availability for bees. Beekeeping-cashew integration led to increased cashew nut yield and alternative income for cashew farmers. The initiatives also promoted social transformation, with increased participation

of women and youth leading to greater economic inclusion and stronger household decision-making. However, challenges related to land and tree tenure continue to limit incentives for long-term conservation. The findings demonstrate that beekeeping serves as an effective pathway for improving livelihoods, strengthening community resilience, and conserving biodiversity, provided that supportive governance and policy frameworks are in place.

Practical Implications for Beekeepers

The findings show that beekeeping offers more than honey production; it can provide diversified income, strengthen household resilience to climate and economic shocks, and create incentives for habitat conservation. Beekeepers benefit from integrating tree planting and environmental stewardship into their operations, which improves forage resources and colony productivity. Cashew farmers get double benefits from cashew-beekeeping integration. The study also highlights the importance of advocating for policies and governance systems that recognise and reward beekeepers' contributions to conserving trees, biodiversity, and ecosystem services. Increased investment in local beekeeping enterprises and inclusive participation of women and youth can further enhance the sector's impact on rural development.

IMPLEMENTING IMPACTFUL BEEKEEPING PROJECTS: AVOIDING COMMON PITFALLS

William Van Blyderveen¹
1 Bees for Development Monmouth, UK

Countries are littered with empty, broken beehives. Projects start, but success proves elusive, with disadoption and abandonment of beekeeping equipment. Projects often focus on hive donations, with no long-term market connections and disconnected from the forests the beekeepers are supposed to conserve. These projects fail, with no benefits to conservation or people's lives. It is critical that beekeeping projects provide the promised livelihood and conservation benefits.

Failed projects affect **communities' perceptions of beekeeping (no benefit) and funders perceptions (beekeeping projects should not be funded because they do not work)**. This review asks two questions: What are common beekeeping development programme pitfalls which limit beekeeping's impact on lives and conservation? How can NGOs, governments, and the private sector address these in project design? Published beekeeping project results available online, Bees

for Development's project learning from across six countries, and findings from key informant interviews in Malawi, were thematically analysed to categorise common beekeeping development mistakes. Results suggested five beekeeping programme mistakes, including: (1) Setting up a project based on unrealistic assumptions, (2) failing to fully consider environmental conditions, (3) over emphasising physical capital (for example bee hives) over social capital – people's knowledge, (4) failing to build in market access from the project start, and (5) not building learning

into project Monitoring and Evaluation processes. These mistakes are fully described and solutions identified for project design and implementation by NGOs, government and private sector. With well designed beekeeping programmes, providing results for beekeepers and conservations, more funding will be available for the beekeeping sector.

Keywords: beekeeping pitfalls, market access, environment, physical capital, social capital, project learning

BEEKEEPING IMPACTS LIVES. A CASE STUDY OF PHYSICAL INCLUSION AND RESILIENCE.

Author: Salim Kugonza

Background

Beekeeping offers sustainable income potential with minimal land requirements. However, individuals with disabilities (PWDs) face systematic exclusion from beekeeping due to inaccessible training and physical barriers. This study examines Mr. Wantate Hussein, a 43-year-old educated youth with a severe physical disability (humpback), who transitioned into commercial beekeeping in Kimenyedde sub-county.

Problem Description

Despite his strong determination, Mr. Hussein faced profound physical weakness, community discrimination, and a lack of start-up capital. Traditional apiculture methods and standard training groups often exclude PWDs, ignoring the need for adaptive equipment, ergonomic workspace adjustments, and inclusive learning environments.

Methodology

A case study approach was used to analyze Mr. Hussein's vocational journey. To bypass physical limitations, he initially used self-directed peer observation. He was then formally enrolled by the Uganda National Apiculture Development Organisation (TUNADO) as a trainee. TUNADO provided specialized, inclusive training

focusing on basic beekeeping, apiary management, hive weaving, colony establishment, and precise harvesting schedules.

Results and Conclusions

With TUNADO's support, Mr. Hussein successfully established a commercial apiary 47 colonized hives. He innovatively adapted his workspace by positioning hives near his home at accessible working heights. By mastering hive weaving, he bypassed high financial entry barriers. The study concludes that apiculture is a highly viable and empowering business venture for PWDs. True sector inclusion requires uniform training standards and community sensitization to eliminate stigma.

Practical Implications for Beekeepers

- Beekeepers with physical limitations must strategically adjust hive height and placement to reduce physical strain and maximize efficiency.
- Investing in self-reliance skills like hive weaving dramatically lowers capital investment requirements.
- Established apiaries should champion inclusive environments, sharing knowledge to welcome marginalized individuals into the local beekeeping trade.

CREATING ECONOMIC OPPORTUNITIES FOR WOMEN AND YOUTH

Author: Aliganyira Nezaphoro, Trias EA

Trias Journey with TUNADO in developing apiculture value chain in Uganda; since 2014 the partnership between two organizations become strong and impactful; changing the lives of over 2000 beekeeping farmers in the country. One of the totable achievements has been increase of women into apiculture value chain, a Mindshift from the past years, where beekeeping was associated with men, especially the elderly. Youth have also embraced the beekeeping enterprise; majority perceiving it a low capital enterprise and less labour intensive:

Apiculture has become a complementary income generating stream to women, and youth, and other vulnerable communities; being a less capital- and labour-intensive enterprise, and being climate smart in nature, it has motivated farmers to engage

in tree planting, woodlot establishment, agro-forestry, thus enhancing ecosystem **restoration, biodiversity conservation and sustainable livelihoods.**

Trias-TUNADO partnership under both FOFS project and DGD program, apiculture sector has moved beyond mere honey production and productivity; to integrate bee products value addition, packaging and branding, research and development to generate new knowledge and insights.

Being a climate smart sector, apiculture attracted many collaborations with other development actors and government agencies and ministries like MWE, MAAIF, international and national agencies like PELUM, CABI, NOGAMU, among other actors.



UNLOCKING THE HIVE: ADDRESSING WOMEN'S TRIPLE ROLE AND STRATEGIC GENDER NEEDS THROUGH THE GENDER ACTION LEARNING SYSTEM (GALS) FOR BEEKEEPING ADOPTION AND HOUSEHOLD RESILIENCE IN UGANDA

Author(s): Birungi Phionah Organisation: The Uganda National Apiculture Development Organisation (TUNADO) Email: bphionah@tunadobees.org

Abstract

Beekeeping offers rural Ugandan households a low cost, climate smart livelihood, yet uptake among women remains limited, not for lack of interest but because of entrenched gender inequality. Applying Moser's gender planning framework, this paper argues that women's triple role, spanning productive, reproductive and community managing work, leaves them time poor, while unequal control over land, trees, beehives, finance and household decision making locks them out of apiculture. Interventions that meet only practical gender needs such as inputs and income, without addressing strategic gender needs, such as control over resources and challenging the gendered division of labour, therefore rarely convert training into sustained beekeeping enterprises. Drawing on TUNADO's field experience, the paper examines

how the Gender Action Learning System (GALS), embedded as a standard methodology in national beekeeping trainings and the Rural Transformation Centre extension model, uses household visioning, the Gender Balance Tree and joint action planning to renegotiate roles and resource control. By dismantling the structural barriers that suppress adoption, GALS enables women to take up beekeeping, diversify income and strengthen household resilience to climate and economic shocks, positioning gender transformation as a precondition for, not a byproduct of, apiculture development.

Keywords: Gender Action Learning System (GALS); Moser triple role; practical and strategic gender needs; beekeeping adoption; women's resilience; apiculture; Uganda (TUNADO)

UNLOCKING THE COMMERCIAL POTENTIAL OF PROPOLIS IN UGANDA THROUGH PRODUCT DEVELOPMENT AND CONSUMER VALIDATION

Deborah Ruth Amulen^{1,2,3*}, Jolly Oder Akullo⁵, Dickson Biryomumaisho^{6,7}, James Okwee Acai^{2,4}, Paul Cross⁸, Joel Mukwaya⁴, Immaculate Nakbugo¹, Patrick Vudriko^{2,4}

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Abstract

Propolis is a high-value bee product with recognized medicinal and commercial applications, yet it remains largely underutilized in Uganda. This study assessed the commercialization potential of propolis by integrating production assessment, product development, and consumer acceptance. Mixed methods were employed, including surveys of 112 beekeepers across four agroecological regions to evaluate production potential and

current utilization practices, and 199 urban consumers to assess perceptions, willingness to purchase, and market acceptability of newly developed propolis products. Standardized processing protocols were developed to produce two novel products, **Afro-Propolis Powder** and **Healthy Propolis Infused Tea**, which were subsequently evaluated for market readiness. Uganda was estimated to have the capacity to produce **325–870 tonnes of propolis annually**,

representing an estimated **US\$11.1–29.6 million** annual revenue opportunity at current farm-gate prices. However, commercialization remains constrained by limited harvesting technologies, inadequate processing capacity, absence of product standards, and low consumer awareness. The developed products demonstrated high consumer acceptance and purchase intention. These findings highlight a scalable pathway for

transforming underutilized propolis into high-value functional products, creating new income opportunities for beekeepers, stimulating private-sector investment, and strengthening Uganda's apitherapy industry.

Keywords: Propolis; Commercialization; Apitherapy; Value addition; Functional foods; Uganda.

DEVELOPMENT OF A SOLAR POWERED BEE VENOM COLLECTOR FOR SUSTAINABLE APITHERAPY PRODUCTION

Background and Purpose

Bee venom is gaining recognition as a valuable product in apitherapy and pharmaceutical applications. Despite its economic potential, collection methods remain limited due to dependence on electricity and costly imported equipment. This study aimed to develop a solar powered bee venom collector that offers an affordable and energy independent solution suitable for rural beekeeping environments.

Problem Description

Conventional venom collection systems require stable electricity supply and expensive components, making them inaccessible to most small scale beekeepers. This restricts opportunities to diversify income through high value hive products.

Methodology

A solar powered system was designed using photovoltaic energy to supply controlled electrical pulses to collection plates. The collector was built using locally sourced materials and tested in an apiary setting with multiple collection plates

connected to a single power unit. Performance was evaluated based on energy efficiency, safety of bees and ease of operation.

Results and Conclusion

The solar powered collector successfully operated without reliance on grid electricity and maintained consistent venom harvesting cycles. Bees responded normally after exposure and colony disturbance remained minimal. The design shows strong promise for enabling low cost venom production in off grid regions.

Practical Implications for Beekeepers

This innovation creates new opportunities for income diversification through apitherapy markets while promoting sustainable use of renewable energy in beekeeping.

Key words

Bee venom collection, Solar powered technology, Apitherapy production, Renewable energy in beekeeping, Value addition in apiculture, Rural innovation, Sustainable hive products

EAST
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Trias & TUNADO: building a stronger
apiculture sector together

SINCE
2014

Trias and the Uganda National Apiculture Development Organization (TUNADO) have been working together to strengthen member-based organisations of beekeepers and support a more inclusive, resilient and entrepreneurial apiculture sector in Uganda.



Trias brings more than **35 years of experience** in East Africa working with organisations representing family farmers and small-scale entrepreneurs. Our expertise includes **organisational development, leadership, inclusion, microfinance, advocacy, enterprise development and value-chain development**. Honey is among the key value chains in which our partners operate.



TUNADO is one of Trias East Africa's key partners in Uganda, with a nationwide membership base of **104,000** beekeepers.

OUR APPROACH CONNECTS THREE PRIORITIES



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Stronger, more inclusive organisations where women, youth and other groups can participate and lead.



PLANET

Climate resilience and environmentally sustainable agriculture and entrepreneurship.



PROFIT

Better businesses, stronger services, collective action and improved access to markets and finance.

Together with organisations like TUNADO, Trias works for an apiculture sector where beekeepers are organised, businesses are resilient, and farmers have a stronger voice in shaping their future.



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In 2025, Trias East Africa supported **13** green or climate-smart initiatives.



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Across these markets, honey accounted for **31,939** tonnes of traded products.



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This work has been achieved with funding from the Belgian Government.



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DAY 3

RETHINKING MODERN BEEKEEPING: ARE WE ADVANCING THE PRACTICE OR CONSTRAINING THE BEES

Miguel Vilas-Boas

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Modern beekeeping has evolved towards greater control, efficiency, productivity, and disease management. Yet, as our ability to manipulate honeybee colonies increases, a standard question deserves renewed attention: are we advancing beekeeping, or are we progressively constraining the bees themselves? From selective breeding and queen replacement to hive design, feeding strategies, swarm management, disease control, and migratory practices, many interventions are designed to optimize colony performance under increasingly managed conditions. However, could some of these practices be reducing behavioural

diversity, resilience, natural selection, and colonies' capacity to adapt to changing environments? Within the sensitive context of beekeeping in Africa, this presentation aims to stimulate critical reflection on the balance between human intervention and the biological autonomy of the honeybee. Rather than questioning technological progress itself, it proposes reconsidering where intervention is beneficial, where it may become excessive, and whether modern beekeeping should focus not only on producing stronger and more productive colonies, but also on fostering bees capable of adapting, surviving, and evolving within their environments.

NATURE-BASED BEEKEEPING IN PRACTICE: DEVELOPING A GLOBAL SET OF PRINCIPLES WILLIAM VAN BLYDERVEEN¹

¹ Bees for Development UK. Monmouth, UK

Abstract

Beekeeping provides a valuable income for rural communities, along with pollination benefits. Beekeepers are active in forest conservation, often understand the role of pollinators, and will engage in pesticide reduction. Based on this link between conservation and livelihoods, NGOs, governments, and the private sector include beekeeping as a Nature-Based Solution (NbS).

Programmes then claim NbS but implement projects without addressing the eight NbS criteria especially systems thinking and instead focus on hive donations. These projects fail, with no benefits to conservation or people's lives. Nature-Based Beekeeping (NBB) is an approach to beekeeping

guided by natural processes. However, NBB does not have a formal set of globally relevant principles to frame beekeeping research and development within the NbS criteria. A review of BfD projects from six countries addressed two questions. What are the principles of NBB within the framework of NbS? How can projects follow these principles in practice?

Nature-Based Beekeeping project learning from Ethiopia, Ghana, Uganda, Malawi, Zimbabwe, Peru and India were thematically analysed to define a set of NBB principles as a guide for research and development programmes. The eight NbS criteria were used as a framework.

Preliminary principles including local knowledge,

local resources, and working with natural systems. These principles shift the focus from capital focused projects to systems thinking. Project case studies provide examples of how to implement these principles in practice.

Principles and examples in practice provide a

guide for implementing beekeeping development programmes relevant to the needs of beekeepers and the needs of a region's beekeeping industry.

Keywords: Nature-Based Solutions, Nature-Based Beekeeping, principles, systems thinking, beekeeping framework

AGROFORESTRY AND BEEKEEPING: THE BENEFITS OF THE MIX OF COFFEE, FMNR AND BEEKEEPING IN GREATER MASAKA REGION.

Author; Amena Dennis

Growing of coffee has been a main activity in Buganda and other areas such as Bugisu region and greater Nebbi. Coffee has been widely promoted in Uganda as major cash crop, making the country to be the second largest coffee exporter (after Ethiopia) of coffee in Africa. TUNADO has been implementing the Macbee project in the districts of greater Masaka. Coffee growing in this region goes hand in hand with emphasis on maintenance of indigenous shade trees such as *Albizia coriaria* and *Ficus natalensis* through Farmer Managed Natural Regeneration (FMNR). This has helped boost productivity as the trees provide shade for coffee. TUNADO has introduced the aspect of beekeeping through the MacBee project and this has given very

interesting results as captured here under:

Promotion of beekeeping as an alternative source of income: Beekeeping has been introduced through the Beekeeper to beekeeper extension model. TUNADO employs an apiary master (AM) i.e. a field extension officer who is also the main driver of the model. Many farmers have been able to add an average of 10 locally woven hives into their coffee gardens and this has resulted in increased pollination because the bees pick pollen from the coffee flowers to make honey, while rewarding the coffee with pollination. Anecdotal data from over 20 interviewed farmers has proved that the yield of the coffee has improved with hives incorporated, as compared to when hives were not there.

FIXED COMB HIVE: AN UNDERRATED TOOL FOR RURAL LIVELIHOODS AND BIODIVERSITY CONSERVATION

Author: Papa Kwodwo Mbroh^a
Affiliation: ^aBees for Development Ghana

Background

Fixed comb hives, including traditional log, woven, bark, clay, and wooden box hives, remain the most widely used beekeeping technologies among rural communities across Africa. Despite their widespread adoption and long history, they are often overlooked in favour of movable-frame or top-bar hives in development programmes and policy discussions. This paper assesses the contribution of fixed comb hives to rural livelihoods and biodiversity conservation, asking the question: How

do fixed comb hives support income generation, environmental stewardship, and sustainable beekeeping among resource-poor households?

Problem Description

Many beekeeping interventions promote 'modern' hive technologies as the primary route to increased productivity and profitability. However, these technologies often require financial investments, technical skills, and management practices that may be inaccessible to many rural households. As

a result, the socioeconomic and ecological value of fixed-comb hives remains poorly understood and underappreciated. This knowledge gap risks undervaluing a technology that continues to support thousands of rural livelihoods across Africa.

Methodology

This assessment draws on experiences from beekeeping programmes implemented by Bees for Development Ghana, supported by field observations, project monitoring data, beekeeper interviews, and practical experiences from rural communities using fixed comb hives. The study examined hive adoption, livelihood outcomes, accessibility, management requirements, and the relationship between beekeeping practices and biodiversity conservation.

Results and Conclusion

The findings indicate that fixed comb hives continue to provide significant economic and environmental benefits. Their low cost and reliance on locally available materials make them highly accessible to resource-constrained households, enabling broad participation in beekeeping. Income generated from honey and beeswax contributes to household resilience and livelihood diversification. Beekeepers earn between US\$200 and US\$1,500 per season. The study also found that beekeepers using fixed-

comb hives often become custodians of forests and habitats that provide forage and nesting sites for bees. This creates a direct incentive for biodiversity conservation, wildfire prevention, and sustainable land management. While honey yields per hive may be lower than those achieved under intensive systems, the overall social, economic, and ecological benefits demonstrate that fixed-comb hives remain a relevant and effective technology for sustainable rural development.

Practical Implications for Beekeepers

The findings demonstrate that successful beekeeping is not dependent on expensive technologies. Fixed-comb hives offer an affordable and practical entry point for rural households, allowing beekeepers to generate income while conserving biodiversity and strengthening ecosystem health. Development programmes and policymakers should recognise the value of fixed-comb hive systems and support their improvement rather than replacement, ensuring that beekeeping remains accessible, inclusive, and environmentally sustainable.

Keywords: Fixed comb hives; Nature-based beekeeping; Rural livelihoods; Biodiversity conservation; Sustainable apiculture; Community resilience.

CONSERVING FORESTS THROUGH RURAL BEEKEEPING: EVIDENCING THE ABILITY OF BEEKEEPERS TO PROTECT NATURAL FORESTS

Chris Keywood¹

¹ Bees for Development Monmouth, UK

Abstract

Natural forests are known to be some of the most florally diverse landscapes on earth, providing exceptional habitats for bees and therefore are productive areas for beekeepers. They are also some of the most biodiverse areas, containing many of the world's unique fauna and flora. Around the world however, these habitats are shrinking. As human settlements expand into the forest areas and economic pressures push forward

deforestation in order to create landscapes with greater income generating capacity, these forests are at risk of disappearing. One of the main activities causing this deforestation is the clearing of the forest landscapes to make room for traditional agricultural cropland. Beekeepers can play an important role in combatting this trend. By using the forests for their income generation there is less pressure on the beekeepers to clear the forested land and as they depend on the

forests for their income, they are incentivised to prevent others from clearing the land as well. Using satellite imagery, we are providing evidence that forests well used by beekeepers are less prone to deforestation than those where little to no beekeeping is taking place. Comparing on the ground studies with Satellite data and vegetation indices we are building a collection of evidence to demonstrate the extent of beekeeper's ability

to preserve their habitats and livelihoods. This evidence can then be used to inform land use policy, assist with development programs and add additional value to the products supplied by these forest beekeepers, allowing them to reach new markets and generate more income.

Keywords: Biodiversity, satellite imagery, rural beekeeping, deforestation, value addition, habitat

HIVEMOVER AS A PRACTICAL INNOVATION FOR IMPROVING HIVE HANDLING AND BEEKEEPER SAFETY

Author: Tarinyeba Clarkson

Background and Purpose

Beekeeping plays an important role in supporting rural livelihoods across Uganda and many parts of Africa. However, routine hive inspection, honey harvesting and transportation of hives often require heavy lifting and awkward body positions. These activities expose beekeepers to physical strain, injuries and frequent disturbance of bees. The purpose of this work was to design and test a movable and adjustable hive stand known as HiveMover that simplifies hive handling while improving safety and efficiency.

Problem Description

Many small scale beekeepers rely on traditional hive stands that remain fixed in one position. When harvesting honey or relocating colonies, lifting heavy hives manually becomes difficult and risky. This limits productivity and discourages expansion of apiaries.

Methodology

A prototype of HiveMover was constructed using locally available metal materials and mechanical components. The structure allows vertical

adjustment and controlled movement of hives during inspection and harvesting. Field trials were conducted in an operational apiary to evaluate ease of use, hive stability and beekeeper comfort.

Results and Conclusion

The HiveMover reduced physical strain during hive inspection and minimized sudden hive disturbance. Beekeepers reported improved working posture and faster handling of hives. This innovation demonstrates strong potential for improving occupational safety and operational efficiency in small and medium scale apiaries.

Practical Implications for Beekeepers

Adoption of HiveMover can support safer hive management, reduce labor fatigue and encourage wider participation in beekeeping enterprises.

Key words

HiveMover innovation, Hive handling efficiency, Beekeeper safety, Apiary mechanization, Ergonomic hive management, Small scale beekeeping, Rural technology adoption

FRAME BACK TO NATURE: A GLOBAL BEEKEEPING INNOVATION TECHNOLOGICAL ADAPTATION IN SMALLHOLDER BEEKEEPING: DEVELOPING AND VALIDATING A LOW-COST MODIFIABLE SYSTEM FOR EXISTING TOP-BAR HIVES TO FACILITATE INSPECTION AND MONITORING

Omisore Abideen
Obafemi Awolowo University

Background/Purpose: The top-bar hive is widely used in smallholder systems for its affordability and simplicity. However, limited internal access restricts routine inspection, colony health monitoring, and timely intervention. This study introduces a low-cost, modifiable frame system to retrofit existing top-bar hives, enhancing adaptability while maintaining ecological principles.

Problem Description: Beekeepers often struggle to manage brood development, pests, and honey harvesting because top-bar hives use fixed combs. This design can reduce productivity, increase colony stress, and cause missed early disease warnings. A critical gap persists: beekeepers lack an accessible, adaptable frame system made for smallholder needs.

Methodology: A prototype frame system was created from local materials and installed in top-bar hives across three apiaries. The frame allowed selective comb removal while maintaining colony structure. During two production cycles, data were collected on inspection frequency, colony disturbance, brood visibility, and honey yield.

Beekeepers gave feedback through structured interviews.

Results and Conclusion: The modified system improved inspection efficiency and brood monitoring without increasing colony aggression or absconding. Beekeepers reported greater confidence in hive management and earlier detection of pests, such as wax moths. Honey yield increased modestly but consistently, attributed to better colony health oversight. The study finds that incremental, beekeeper-centered innovation can enhance traditional systems while maintaining ecological integrity.

Practical Implications for Beekeepers: This innovation is a low-cost, scalable option. It lets smallholders shift from reactive to proactive management. It improves decisions, reduces losses, and supports sustainable, back-to-nature methods without replacing entire systems.

Keywords: Top-bar hive innovation, smallholder beekeeping, hive inspection, low-cost technology, sustainable apiculture, colony monitoring

BACK TO NATURE, A GLOBAL BEEKEEPING INNOVATION

By Japheth and Doreen Kwiringira

Bees are pollinators and catalysts of global innovation in sustainable livelihoods. Evidence shows that their work regenerates wild flora, thereby preventing soil erosion, and enhancing plant genetic diversity, while simultaneously providing resources such as honey, venom, propolis, beeswax, pollen, and royal jelly. According to UNEP and FAO, bees contribute to the pollination of one in every three

bites of food we eat, linking biodiversity directly to food security. Globally, apiculture is emerging as a transformative innovation, empowering youth and women, fostering inclusive agribusiness, and reducing reliance on chemical-dependent agriculture by encouraging natural pest control.

Bees embody resilience and adaptability,

regenerating ecosystems across diverse agro-ecological zones; rural or urban, fertile or marginal. Their role extends beyond ecology into health, economic, and social wellbeing, positioning apiculture as a driver of the Sustainable Development Goals (SDGs 1, 2, 13 and 15). Household-level beekeeping reduces carbon footprints by localizing production, while globally, it inspires a pro-nature mentality that shifts human behavior toward cleaner, more conscious living.

Sustainable beekeeping innovation addresses pressing challenges such as pesticide misuse and biodiversity loss. It calls for technical, institutional, and financial support to scale agroecological methods that safeguard bees and their habitats. As a global innovation, apiculture bridges biodiversity with livelihoods, ensuring that more bees mean more meals, more jobs, and more resilient communities. To unlock this potential, stakeholders must prioritize reducing harmful herbicides and invest in bees, the true breadwinners of nature.

NOUREDDINE ADJLANE — HEALTH NOTE 2, VARROA DESTRUCTOR

PROF. NOUREDDINE ADJLANE — HEALTH NOTE 1, HONEY BEE WELFARE

BEES FOR DEVELOPMENT

Making Life Better with Bees

OUR VISION

We believe in the power of bees to create sustainable livelihoods for people around the world. We see a world where bees, people and the planet are mutually benefiting from beekeeping. Where vulnerable communities around the world – including women, people living with disability and marginalised groups – have the opportunity to support themselves with bees.



OUR HISTORY

When we started work in 1993, beekeeping was considered a limited value activity. However we believed strongly in the importance of bees in helping to make livelihoods more resilient and successful.

We work with our partner organisations in **Ethiopia, Ghana, India, Malawi, Peru, Uganda, Zimbabwe** and many other countries around the world. We advocate low-cost, locally appropriate nature-based beekeeping techniques. Over the years, our work has expanded to include training, mentorship, market access, education, and village savings groups.

Our work helps to address all 17 of the Sustainable Development Goals (SDGs). These goals were adopted by the United Nations in 2015 as a universal call to action to end poverty, protect the planet and ensure that by 2030, all people enjoy peace and prosperity.

OUR APPROACH

Beekeeping can help to alleviate poverty, help to address social inclusion and encourage people to conserve their environment.

We train beekeepers in simple, sustainable, and profitable methods.

How:

Beekeeper training

Supporting women, people with disabilities, and marginalised communities

Education

Biodiversity conservation

Routes to market

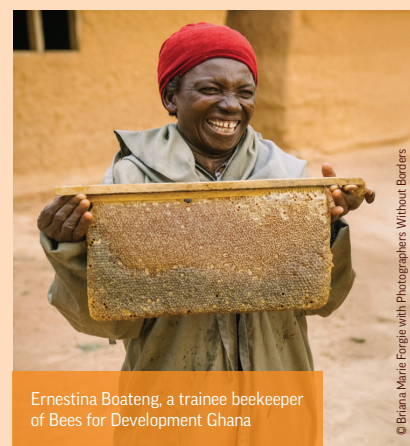
Knowledge sharing

OUR MISSION

To teach nature-based beekeeping with local trainers using local beekeeping methods and local bees, all contributing to a positive impact on both people's livelihoods and the environment they live in.

WHO SUPPORTS US

Bees for Development is honoured to have the support of dedicated individuals who share our vision. Our **President** is **Her Majesty The Queen**, and we are privileged to have the backing of our esteemed **Patrons** who help champion our cause and extend our reach.



UK Charity number: 1198116

CONTACT US

Bees for Development shares learning through an online Resource Centre, quarterly email Bee Bulletin, and a Bees for Development Journal. Please visit our website or contact us to learn more about these free resources.

Learn more at beesfordevelopment.org



DAY 4

APITHERAPY (OVERVIEW)

Dr. János Körmendy-RÁCZ
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Apitherapy is the use of bee-related products for nutritional, preventive, and therapeutic purposes. The term *apitherapy* was coined by the physician Dr. Bódog F. Beck from *Apis*, the Latin word for bee, and *therapeia*, the Greek word for treatment or healing. Originally, apitherapy referred to bee venom therapy; today, its scope has expanded considerably and encompasses a broad range of products and therapeutic approaches associated with honeybees and the bee colony.

Thirteen principal bee-related products can be distinguished. Honey is a natural sweet substance produced by bees from nectar or honeydew. Propolis is produced by bees from resinous plant materials, which they collect and process with their own secretions to form a biologically active substance rich in bioactive compounds. Royal jelly is a nutrient-rich glandular secretion produced by nurse bees and used to feed larvae and the queen. Pollen is flower pollen collected by bees and is rich in proteins, vitamins, minerals, and other biologically active substances. Bee bread is pollen stored in the comb and transformed through enzymatic and microbial processes. Drone larvae are male bee larvae and represent a source of proteins and bioactive substances, while queen larvae, fed with royal jelly, have distinct nutritional and developmental characteristics. Dried bee bodies are dried adult bees used in various traditional applications. Beeswax is a natural wax secreted by worker bees and used for comb construction and numerous practical applications. Bee venom is a biologically active secretion containing peptides and enzymes, with melittin as its major component. Wax moth larvae are organisms closely associated with the beehive and are used in specific preparations. Hive air is air extracted directly from the bee colony. Finally, the energetic field of the

bee colony, including sound and temperature, forms the basis of beehive therapy.

These bee-related products differ substantially in their physical and biological properties, processing requirements, and durability. Honey has the longest shelf life and can remain stable for extremely long periods; honey approximately 3,000 years old has been reported from ancient Egyptian contexts. Beeswax and propolis can remain stable for many years or even decades. Bee bread has an expected shelf life of approximately 2–5 years, while pollen generally remains stable for 1–2 years. Royal jelly, bee venom, and dried bee bodies have considerably shorter shelf lives, typically measured in months. Drone larvae are more perishable, with durability measured in weeks, whereas queen larvae and wax moth larvae may remain suitable only for days without preservation. Hive air and the energetic field of the colony are immediate products or phenomena and therefore cannot be stored.

The risk profiles of these products also differ considerably. Bee venom represents the highest-risk product because exposure can cause severe systemic allergic reactions, including potentially fatal anaphylaxis. Hive air represents another important risk, as inhalation may induce severe reactions and, in exceptional cases, can be fatal. Pollen presents a moderate risk, particularly in sensitized individuals, whereas propolis is associated with a comparatively lower risk. Among the products considered, honey generally presents the lowest level of risk. Thus, bee-related products differ markedly not only in their origin and biological properties but also in their durability and potential risks, characteristics that are fundamental to understanding the broad contemporary concept of apitherapy.

BIOLOGICAL ACTIVITY OF UGANDAN PROPOLIS FROM FOUR ECOLOGICAL ZONES: ANTIOXIDANT AND ANTIMICROBIAL POTENTIAL FOR APITHERAPY

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Propolis is a bioactive bee product with well-documented therapeutic properties; however, little is known about the biological activity of Ugandan propolis despite its increasing potential for apitherapy and value-added product development. This study comparatively evaluated the antioxidant and antimicrobial properties of propolis collected from four ecological zones of Uganda. In 2019, raw propolis samples were collected from 112 beekeepers in the Eastern Savannah (Soroti), Mid Northern Farming System (Lira), Western Rangelands (Bunyangabo), and Northeastern (Karamoja). Samples were pooled by ecological zone and extracted using aqueous methanol before determination of extraction yield, total phenolic content (TPC), antioxidant activity using the DPPH radical scavenging assay, and antimicrobial activity against *Staphylococcus aureus*, avian pathogenic *Escherichia coli*, and

Aspergillus niger. Four distinct propolis colour types (black, brown, orange, and yellow) were identified, accompanied by marked ecological variation in extraction yield, total phenolic content (22.7–130.2 mg GAE/g), antioxidant activity (15.8–34.5%), and antimicrobial activity. All extracts inhibited *Staphylococcus aureus* (MIC: 0.125–0.25 g/mL), whereas no inhibitory activity was observed against *E. coli* or *A. niger*. These findings demonstrate that ecological origin influences the biological properties of Ugandan propolis and provide a scientific foundation for the development, standardization, and quality assurance of locally sourced propolis-based apitherapy products.

Keywords: Propolis; Antioxidant activity; Antimicrobial activity; Apitherapy; Phenolic compounds; Uganda.

INFLUENCE OF THE INSTITUTIONAL FRAMEWORK ON THE PROCESSORS' PRACTICES FOR PROPOLIS TINCTURE PRODUCTION IN UGANDA

Abstract:

Propolis tincture, a growing medicinal bee product in Uganda, has attracted investors, but stakeholder practices and adherence to institutions remain unclear. A qualitative study consisting of focus group discussions with 22 purposively selected propolis tincture processors (PTPs) from Kampala, Lira, and Arua cities and key informant interviews with seven staff from government agencies responsible for apiculture regulation and support was conducted. The study found that processors rely on norms, beliefs, and a national beekeepers training and extension

manual, with little formal guidance. There is information asymmetry and poor coordination among agencies. Findings further revealed that PTPs believe that adherence is possible with guaranteed access to bigger markets, blocking entry of substandard goods on the market and simplification of certification processes. The study recommends developing formal specifications to complement informal norms.

Keywords:

Institutional frameworks; propolis tincture; processors practices; beekeeping.

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Home Use of Apitherapy
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Apitherapy encompasses a remarkably diverse group of bee-related products: honey, propolis, royal jelly, pollen, bee bread, drone larvae, dried bee bodies, hive air, bee venom, the energetic field of the bee colony, wax moth larvae, queen larvae, and beeswax. From the perspective of safety and the level of professional control required, the application of bee-related products can be classified into at least three major

levels: pharmaceutical use, medical or naturopathic use, and home use.

The first level comprises products and preparations that should only be used therapeutically following appropriate pharmaceutical processing, standardization, and quality control. This category includes bee venom injections, drone-larva extracts, preparations made from dried bee

bodies and drone larvae, beeswax products such as therapeutic candles, ear candles and beeswax compresses, and standardized propolis extracts. Pharmaceutical processing is particularly important when a preparation requires defined composition, concentration, or reproducible quality before therapeutic application.

The second level includes medical and naturopathic applications of apitherapy. These uses require professional knowledge of the product or method, its administration, dosage where applicable, possible adverse reactions, and the individual characteristics of the person receiving it. This category includes live bee-sting therapy, hive-air therapy, and beehive therapy based on the energetic and other physical effects of the bee colony. These methods involve direct exposure to biologically or physically active components of the living bee colony and therefore require an appropriate level of professional knowledge and supervision.

The third level comprises bee-related products and applications that are suitable for home use and are associated with minimal risk. This category includes honey, propolis, royal jelly, pollen, bee bread, hive air and beehive therapy under the

supervision of a trained beekeeper, as well as the use of ordinary beeswax candles. These applications can be incorporated into everyday life without pharmaceutical preparation or continuous medical supervision. Nevertheless, the appropriate level of supervision depends not only on the product itself but also on the way in which it is used. Hive air and beehive therapy, for example, may therefore appear in both professionally supervised and home-use categories when home application is carried out under the supervision of a trained beekeeper.

The distinction between pharmaceutical, professionally supervised, and home applications provides a practical framework for understanding the wide spectrum of contemporary apitherapy. The categories are based primarily on the form of application and the level of professional control required rather than exclusively on the identity of the bee-related product. The same product may consequently occur at different levels depending on its preparation and method of use. The present lecture focuses specifically on this third category and provides a detailed overview of bee-related products and apitherapeutic methods that can be used in the home environment with minimal risk.

FROM HIVE TO APITHERAPY ENTERPRISE: A UGANDAN PRACTITIONER CASE STUDY IN PROPOLIS TINCTURE DEVELOPMENT

Authors: Mrs Margaret Ader Ogaba¹, Linda Achan^{2*}

Affiliations:

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² Independent Co author, London, United Kingdom

***Corresponding author:** linda@nature-wrap.com **Presentation preference:** Oral presentation

Symposium theme: Venture into Apitherapy Business

Background/purpose:

African beekeeping enterprises often depend primarily on honey, although propolis offers an additional pathway for diversification, value addition and livelihoods. This practitioner case study examines how specialist apitherapy training was translated into the development and sustained commercialisation of a propolis tincture in Uganda.

Problem description:

Moving from raw propolis to a responsibly produced, market-ready apitherapy product requires more than access to bee resources. It depends on specialist knowledge, hygienic preparation, production discipline, responsible communication, market access and the ability to build trust without overstating therapeutic claims.

Methodology:

A descriptive practitioner case-study approach drew on the lead author's 2003 apitherapy training in Germany under Dr Ștefan Stângaciu, supported by Uganda's National Agricultural Advisory Services, alongside her own financial contribution. Evidence included apiary and production experience, inspection and retail evidence, product observation, and customer and retailer engagement in Uganda and at international honey shows. Customer-reported uses were treated as market observations, not evidence of clinical efficacy.

Results and conclusion:

Propolis, often called "bee glue", has long been valued for its adhesive and preservative properties. In Ugandan practice, it has been used to repair cracked clay pots and wood, while historical accounts associate propolis with ancient Egyptian embalming and mummification. Following the 2003 training, the practitioner developed a propolis tincture, ointment and water all prepared in an inspected production environment and sold through trusted retail channels, including World of

Bees in Kampala. Repeat purchases and customer demand indicate sustained market interest. She has also trained more than 100 people in beekeeping and bee-product value addition, with some trainees now training others. The case demonstrates that specialist learning, hygienic production, market trust and knowledge transfer can convert an underused hive resource into an enterprise pathway.

Practical implications for beekeepers:

Propolis can broaden the economic value obtained from managed colonies and support diversification beyond raw honey. The case does not establish therapeutic efficacy or chemically characterise Ugandan propolis. Further work could include compositional analysis and collection of market and user data. For African beekeepers, entry into apitherapy requires specialist knowledge, hygienic production, responsible communication, knowledge transfer and market trust.

Keywords: Propolis; apitherapy; value addition; beekeeping enterprise; knowledge transfer; Uganda

BEE KEEPING IMPACTS LIVES. A STORY OF THE BATWA – SOUTHWESTERN UGANDA

Author: Claire Kahunzire

Bwindi Mgahinga Conservation Trust (BMCT), a conservation Trust Fund established by act of Parliament to protect the biodiversity and ecosystem health of Bwindi Impenetrable National Park (BINP) and Mgahinga Gorilla National Park (MGNP) in harmony with the development needs of the surrounding communities.

The Batwa are a vulnerable group of indigenous people found in western Uganda. Formally, the Batwa were largely dependent on resources from forests which later gazetted to form BINP and MGNP.

Apiary is one of the development and conservation enterprises promoted by BMCT. Within the Batwa community, BMCT uses an integration approach in

which Batwa beekeepers are encouraged to form or join groups together with non-Batwa beekeepers and are then supported through the entire Apiary value chain with training, inputs, marketing and branding.

The purpose is to leverage on the traditional knowledge of the Batwa people in bee keeping, reduce social stigma while improving their livelihood and conserving the environment.

The result is, well organized groups of Batwa and non-Batwa beekeepers where knowledge, skills and resources are shared promoting environmental conservation, wealth and improved living standards for both Batwa and non-Batwa within National Park neighboring communities.



WWF UGANDA PROMOTING BEEKEEPING FOR SUSTAINABLE LIVELIHOODS AND BIODIVERSITY CONSERVATION IN THE ALBERTINE RIFT

The Worldwide Fund for Nature Uganda Country Office (WWF Uganda) is promoting beekeeping as a transformative Nature-Based Enterprise that creates sustainable incomes while advancing biodiversity conservation across the Albertine Rift. By equipping community groups, women, and youth with modern beekeeping, quality assurance, and enterprise management skills, WWF Uganda is helping producers increase honey yields, improve product quality, and strengthen household livelihoods.



Through collective production and marketing, beekeepers are able to aggregate volumes, improve bargaining power, access financial services, and connect to lucrative local, regional, and national markets.



To enhance market access and competitiveness, WWF supports the formation and strengthening of producer groups, cooperatives, and community enterprises. Through collective production and marketing, beekeepers are able to aggregate volumes, improve bargaining power, access financial services, and connect to lucrative local, regional, and national markets. This approach also provides buyers with reliable quality and sustainably produced honey and other bee products.

WWF Uganda further promotes value addition through honey processing, packaging, branding, and storage, enabling producers to capture greater value from their products. In addition to honey, communities are increasingly benefiting from other high-value bee products such as beeswax, propolis, and pollen, creating diversified income streams and improving resilience to economic and climate-related shocks.

A unique strength of WWF's beekeeping model is its integration with

landscape restoration, agroforestry, and sustainable natural resource management. Since healthy bee populations depend on healthy ecosystems, the enterprise creates strong incentives for communities to protect forests, restore degraded landscapes, and conserve biodiversity. Beekeeping therefore generates income while directly supporting environmental stewardship.

The initiative also contributes to reducing human-wildlife conflict through WWF's Conflict-to-Coexistence (C2C) approach, which promotes the strategic placement of beehives along farm/protected area boundaries to deter crop-raiding wildlife while generating household income.

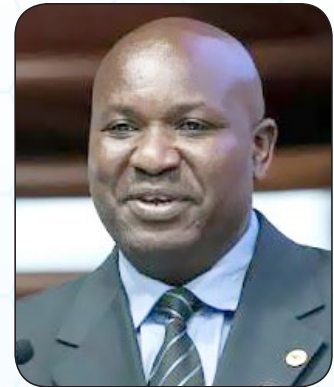
By linking conservation with inclusive economic opportunities, WWF Uganda is building resilient communities, empowering women and youth, strengthening sustainable honey value chains, and safeguarding the Albertine Rift's globally important ecosystems for future generations.

ORGANISING COMMITTEE



Megan Denver
Chairperson
Scientific Commission
on Beekeeping

David Mukomana
Chairperson
Regional Commission
for Africa



LOCAL ORGANISING COMMITTEE



Dr Dickson Biryomumaisho
Executive Director
(Coordinator)



Lawrence Tusiimomuhangi
Commissioner Productive
Insects - MAAIF (Protocol)



Dr. Narisi Mubangizi
Makerere University
Documentation - Member



Muwanguzi Steven
(Communications)
Member



Phionah Birungi
Programme Manager
(Assistant Coordinator)



Dr Amulen Deborah
Makerere University
– Abstracts - Member



Walusimbi James
Member



Bomujuni Allon
(Membership Mobilisation)
Member



Isaac Soyi
TUNADO – Finance
Member



Tashobya Gwendoline
Secretariat coordination
Member



Amenna Dennis
Member

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