

**PP-484 [Beekeeping for Rural Development]
Integrating Sustainable Beekeeping and Environmental Stewardship Using 20-Liter Water Bottles as Alternative Beehives in Uganda:**

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Sustainable beekeeping is an essential practice that supports biodiversity, enhances ecosystem resilience, and provides socioeconomic benefits to communities. In the context of resource efficiency and environmental stewardship, the use of 20-liter empty water bottles as alternative beehives offers an innovative, cost-effective, and eco-friendly solution. This approach not only repurposes waste materials but also lowers the entry barrier for small-scale beekeepers, particularly in resource-constrained communities.

This paper examines the design, implementation, and benefits of utilizing recycled water bottles as beehives. It explores their potential to provide a suitable habitat for bees, their effectiveness in maintaining bee health, and their role in reducing plastic waste in the environment. Additionally, the study highlights the integration of these hives into broader conservation efforts, such as promoting pollinator-friendly vegetation and engaging local communities in sustainable practices.

Case studies demonstrate the practicality -scalability of this method, showcasing its potential to support biodiversity while encouraging responsible waste management. The paper concludes by advocating for the promotion of alternative beekeeping models that align with the principles of circular economy and environmental conservation, making sustainable beekeeping accessible and impactful in diverse settings. Using 20-liter empty water bottles as alternative beehives offers several advantages, particularly in promoting sustainable beekeeping and environmental stewardship. These benefits include:

- 1 Cost-Effectiveness, Reduces the financial burden of traditional hive materials like wood, Waste Repurposing, Reuses plastic waste, contributing to waste reduction and promoting circular economy principles. Reduces environmental pollution caused by improper disposal of plastic bottles.
2. Lightweight and Portable, Easy to transport and install, allowing for flexible placement in urban, rural, or remote areas. Suitable for nomadic or migratory beekeeping practices.
3. Weather Resistance, Plastic bottles are resistant to weather conditions such as rain, humidity, ensuring longer durability compared to certain traditional materials.
4. Ease of Maintenance, Transparent bottles allow beekeepers to monitor hive activity and health without disturbing the bees. Simplifies hive inspection, reducing stress on the colony.
6. Scalability, Enables quick and affordable scaling of beekeeping operations, especially in regions with high demand for honey, pollination services.
5. Environmental Impact, Encourages the growth of local pollinator populations, supporting biodiversity and agricultural productivity.