



The Smart Automated Bee-Hive

Ivan John Nyaindi and Michael Gido Jengela

Marian Boys High School



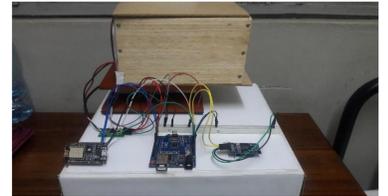
Introduction

The automated bee-hive is a device that aims to ease the bee-keeping processes. It records the weight, temperature and humidity to give information on the progress of the honey produced. By proper examination of these data, the bee-keeper is able to identify when the honey is ready for harvest rather than the regular visits to the bee-hives. This mainly prevents the smoking of the hives which is dangerous to the bees and the bee-keeper.

Method

The smart automated bee-hive consists of,

- A bee hive
- A sensor to measure temperature and humidity inside the bee-hive (DHT11)
- A sensor for measuring weight to measure the weight of the bee-hive (Load Cell)
- A load cell amplifier to convert the analogue results of the load cell into digital results that can be processed by an Arduino.
- The Real Time Clock module(RTC) that provides time on which the data was recorded.
- An Arduino (UNO) as a processing centre.
- An application that will act as a dashboard to view the results.
- A Wi-Fi module to send information from the beehive to the farmer.



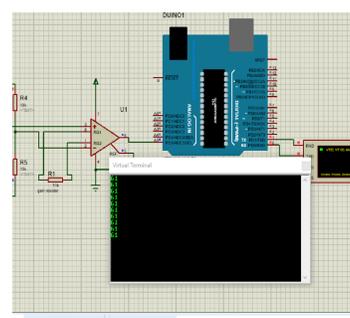
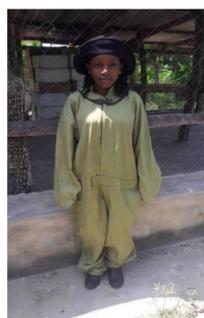
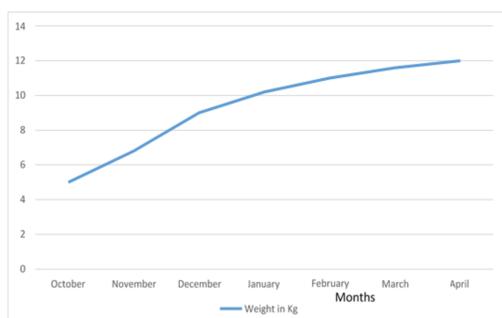
Results

The smart automated bee-hive, collects the data from the weight sensor, temperature and humidity sensor and sends this information to the bee-keeper through a Wi-Fi module

Once these data start reflecting the characteristics of readiness and the rate of increase of the weight of the honey remains relatively constant or starts to decrease, then the honey can be termed ready for harvest, and that is when the farmer visits the beehive, that is only once for the harvest.

The research fed us that most bee-farmers in Tanzania still use the smoking method for the regular checking of the hives. They tend to smoke the hives, making the bees inactive for them to check the honeycombs. The farmers said that they normally check for white capping's that seal the honey combs meaning that it is ripe.

It was also observed that features such as weight vary according to the amount of honey as shown below.



Conclusion

This result reveals the need of the smart automated bee-hive that eases the bee-keeping process, since the smart automatic bee-hive can give data to show whether the honey is already ripe or not, rather than going physically to check for the white capping's. It also reduces the health risks that area accompanied with smoking of the Hives

According to the results obtained, the Automated smart bee-hive helps the bee-farmers by ensuring accuracy in their work, reducing the load of regularly visiting the bee-hive to check for the progress, also helps to monitor multiple hives at once. As the knowledge grows, we hope to see more development on this project, especially the one of automatic harvest of the manufactured honey.

References

- Wikipedia (<https://en.wikipedia.org/wiki/Honey>)

Acknowledgments

We would like to appreciate the help provided by the following individuals towards the success of this project. Your sacrifice means a lot.

- Grace John – For the help in research conductance.
- Mrs. Munuo – For letting me use her bee-farm for research.
- Namtero Eve – A graduate in University of Dar es Salaam who helped to gather information on honey