

IMPACTS OF CLIMATE CHANGE ON BEE KEEPING FARMERS – MAKUENI COUNTY, KENYA

The agriculture sector is a major contributor to Kenya's economy in terms of food and nutrition security, employment creation, supply of agro-based industry raw materials and foreign exchange earnings. About 98% of Kenya's agricultural activities are rain-fed and highly susceptible to climate change and climate variability. The susceptibility of the agricultural sector to climate change is likely to compromise attainment of the sector's contribution to food and nutrition security, national economy and the global Sustainable Development Goals (SDGs).

Makueni County is one of the climate vulnerable counties in Kenya. It is commonly comprised of agro-pastoral community and is characterized by high population density with majority of the communities being predisposed to the negative effects of a changing climate. The changing climatic conditions have resulted in intense and frequent droughts, that have subsequently led to lack of adequate water, insufficient food, increased incidences of opportunistic diseases, increased insecurity, water resources related conflicts, reduced income among the households, and these are key factors that have increased vulnerability and reduced the resilience of the County to changing climatic conditions.



In response to food insecurity the communities have embraced bee keeping which is now facing severe climate challenges as witnessed in Makueni County – Wote Division, Kathonzweni location in Kenya.

Farmers are unable to cop up with bee migrations from their apiary to Mbooni Hills due to persistent drought and increased temperature as a result of climate change. In addition the bee colonies have rapidly reduced compared to the previous years as a result of climate change. Bees have also been affected by the frequent use of pesticides in nearby fruit (Mangos and Oranges) and animal farms. Farmers spray their farms early in the morning when the bees are outside looking for nectar. This has resulted in low volumes of the colonies in the available beehives.

Farmers can attest to the fact that the production of honey has gone down compared to the previous years, one hive could produce more than 30 Kilograms of honey compared to 8 Kilograms of honey that they harvest now due to the climate change impacts within the location, the use of pesticides, low funding from the government and development partners, lack of

technical skills and training required by the bee farmers to adopt to the impacts of climate change, lack of water and training facilities, increase in population within the area, and over grazing are some of the challenges that have made it difficult for the farmers to meet the market demand of honey that is required locally.

Worth noting is that grass which plays a major role in honey production has also been affected by the varying climatic conditions and the high demand for grass due to over grazing in Makueni County. The increase in population has resulted in substantial tree cutting for agricultural land, house hold building and firewood, limiting the space required for bee keeping and honey production.

Innovative measures are therefore needed to help farmers especially bee keepers to cope with the changes in emerging and projected climatic patterns. Pesticide manufacturers need to produce solutions that are friendly to bees and the eco system. Farmers also need to plant trees that are favorable to bees - trees like the *Coriander* and *Leucaena*.

The government of Kenya and the development partners need to work together to help the bee farmers in terms of funding and training on some of the best approaches to deal with the effects of climate change and the production of quality honey.

Bees can also be supplemented with molasses, sugar and water to increase the food ratio required for the production of honey. Water scarcity can be solved by; digging water puns to harvest water during the rainy seasons, drilling of boreholes at designated areas will help farmers in irrigation and domestic use. Farmers should also be urged to use the modern Langstroth bee hive as it yields more and quality honey compared to the traditional beehives that they have been using in the past.



Bee Farmers in Makueni County, showcasing the different types of honey they harvest.

The residents of Makueni should keep a controlled number of animals to avoid overgrazing on the available vegetation that affects honey production within the same locality. Farmers should also be encouraged to plant different types of grass that are favorable to the climatic conditions like the *Brachiaria* fodder grass and *boma rhodes* grass, this will go a long

way in feeding the animals and supplement food for bees.

Youth in Makueni should be encouraged to invest and learn more about bee keeping as this will increase the volume of honey production and also offer employment to most of the youths who are unemployed at the moment.

The county government and administration officers should consider training bee farmers as a priority since honey can offer great economic growth within the county and supplement the demand for honey products that cannot be met.



**Langstroth bee hive used in Makueni County,
The hives are kept in a hut due to increased
temperature and unpredictable weather pattern**



**Effects of climate change on grass that is a vital
element in the production of honey in Makueni
County**

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