

A framework for an early warning system for the management of the spread of African Migratory locust (AML) invasion in Zambia based on Artificial Intelligence Technologies.

The manual monitoring of African Migratory Locust invasion by Ministry of Agriculture experts is not only inefficient and unsustainable but also a costly undertaking. A framework for an early warning system for the management of the spread of Locust invasion based on Artificial Intelligence and other emerging technologies such as Internet of Things (IoT), Geospatial, and cloud computing technologies project will automate the process. A sticky trap fitted with a light bulb will enable effective catching of targeted insects. Each sticky trap will be energy independent using a battery that will be charged by solar energy. The Raspberry Pi microcomputer, connected with a camera and sensors, will form part of the perception layer of the proposed IoT node. The camera will automatically take images of the captured pests daily while sensors will collect environmental variables such as temperature, humidity, soil moisture, wind direction, wind speed and rainfall,. The local weather data will be of help in identifying the favourable conditions that influence the proliferation of African Migratory Locust (AML). Convolutional Neural Network (CNN) will be used for object detection. The layers that will be used in the model include input, convolution, pooling and dense layers. Rectified Linear Unit and SoftMax activation functions will be incorporated amongst other software such as TensorFlow libraries for model designing and training.