Abstract

Nigeria being an agricultural country needs some innovation in the field of agriculture. Monitoring and control of farming environment play an important role in farming production and management. Farm lands and plantations in Nigeria and African countries are usually very large scale running into hundreds of acres and in most cases fencing these large expanses of land can be prohibitively expensive and very stressful. Farmers therefore resort to building fences using sticks and ropes and these provide the only security measure they can adopt. These security measures are trivial and very ineffective as intruders can easily jump over them and cart away with as much crops as they can carry without the knowledge of the owners, especially when such fences are built around dark crevices. Also, with the present situations in Africa where farmers are facing security threats in their farms, especially with the Fulani herdsmen, the wireless sensor networks technology can be used in this effect to get real time information of the farm and know when an intrusion occurs, the nature or type of intrusion with the necessary action(s) to follow. The architecture of the WSNs system comprises of a set of
Design and Implementation of Farm Monitoring and Security System

sensor nodes, surveillance facilities and a base station that communicate with each other and gather information to make decisions about the situation at hand. The system overcomes the limitation of building fences using sticks which can be very much stressful. It also has the advantages of motion detection, an alarm and alert system as a security measure. One of the new features included in this work, is an alarm system which will be raised to scare the intruders to leave the farm premises. When the intruder stays for more than 30 seconds on the farmland, the GSM module is used for sending SMS to the farm owner indicating the nature of intrusion. It alerts the farmer that some human (mostly) or animals or birds are on the farm. The other feature includes the metallic sensor which informs the farm owner if a human being who intrudes the farm is armed (with metallic objects such as knife, cutlass, gun, etc.). The system is optimized with the aim of achieving maximum plant growth and yield.

References


Index Terms

Computer Science                     Security

Keywords

FMSS, WSNs, sensors, Precision Agriculture, Arduino, ZigBee, Microcontroller