

## **Remote poultry management system for small to medium scale producers using IoT**

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### **Abstract**

The demand for poultry products continues to increase in the world. The prevailing global climate change calls for improved poultry management systems to maintain optimal environmental conditions for boosting productivity. Increased food security based on sound, equitable and sustainable food production systems that utilize modern automation technologies is essential for all nations to be able to achieve the United Nations Sustainable Development Goals (UNSDGs). This proposed study seeks to help achieve some of the UNSDGs which include ending poverty, having zero hunger, good health and well-being, industry innovation and infrastructure. In this article, the design and implementation of a low-cost IoT-based remote poultry management system for small to medium scale producers is presented. Poultry farmers in developing countries are relying on manual poultry management methods which are labor-intensive. The proposed system which was built around the WiFi-enabled ESP8266 NodeMCU microcontroller is capable of monitoring and regulating temperature, humidity, water level, ammonia gas and the lighting system. Security is facilitated by the PIR sensor. The system minimizes employment costs and saves time. Besides, the system has unique capabilities of light scheduling and automatic switching control. The light schedules are pre-configured, and the user can select the required times of illumination. The illumination times in the evening are guided by the age of the birds. Light scheduling improves egg production and also conserves energy. The proposed light scheduling for the system was possible by executing a “cron job”. A “cron job” enables the web server to perform repetitive and specific tasks at specific times. Remote monitoring and ease of accessibility of the system via the internet anywhere in the world using devices like smart phones and laptops is facilitated by our proposed web-based portal [www.agrorun.co.zw/](http://www.agrorun.co.zw/). The web page also allows users to turn ON or OFF the actuators like fans, blower fan/extractor fan, water pump and the lights.