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Smart Farming for Enhanced Farm Security: Mitigate Wild-Birds Intrusion in Agriculture Farms in Nepal

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Abstract

With more and more instances of wild bird intrusion in the standing crops causing significant losses to agricultural yields, there is a growing need for creative and effective solutions to the urgent problem of farm protection. This study investigates a method to apply smart farming technology to this problem. The current demand for sustainable management of the issue is the introduction of Internet of Things (IoT) devices, such as cameras, sensors, and automated deterrent systems, for small and medium farms, to develop a proactive and strong farm protection system. By combining these technologies, a more secure and sustainable farming environment may be created through real-time monitoring, early bird detection, and prompt response mechanisms. This serves as more evidence of the IoTs' potential to revolutionise conventional farming methods, improve bird-human cooperation, and ultimately protect farmers' agricultural investments. The study explores potential ways to control birds' incursions into farmers' standing crop-fields, particularly in Nepalese cereal based farming systems. An approach to the issue would be to repel the approaching birds in farmland by using LED technology. The creative application of LED (Light Emitting Diode) technology serves as an inexpensive, practical method of keeping encroaching birds out of agricultural fields without endangering the animals or the farm. The approach focuses on the creation of an automated "ledger light" system that uses carefully positioned LED lights to make the field regions visually undesirable to the birds. This system is controlled by motion camera sensors or sound detection. The particular light spectrum and patterns that are repulsive to the specific wild birds are then produced by the ledger light. This novel approach not only tackles the problem of preventing birds from damaging crops, but it also advances sustainable farming methods. Together with a concept of smart, tech-friendly IoT use in the Nepalese farming system, these ideas offer a promising alternative for farmers seeking compassionate and non-intrusive ways to decrease human-wildlife conflicts in agricultural environments. The results present an innovative way to deal with the difficulties posed by a variety of instances of animal-bird intrusion in agricultural settings, which contributes to the rapidly developing matter of wildlife and wild bird management. This approach could provide farmers with a practical, ethically acceptable, and ecologically sound way to reduce confrontations between humans and nature while preserving crops and encouraging sustainable coexistence.

Keywords: *agricultural farmland, crop management, human-bird interaction, iot, smart farming*