

Early Identification of Major Pest attacks Caused to Crop Loss in Paddy Fields: A Case Study

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Unrecognized or late recognized pest attacks are one of the major problems which lead to crop loss in paddy cultivation. According to the most recent season harvest Data of Rice research institute, it was recorded 40% of crop loss in the paddy cultivation in the *Hambanthota* district. Under a preliminary survey, it was identified Aphids, Brown-planthoppers, and Thrips were the major pests that caused the crop loss in paddy in the selected area. Due to the lack of proper knowledge in identification and lack of timely and accurate information, farmers are struggling to identify and control these pest attacks in their paddy fields. Due to crop loss, most of them are losing their money, interest, time, and confidence in paddy cultivation. During the study, domain experts revealed that early identification and early-stage of controlling these pests can save the majority of the crop loss and save lots of money which were spent on pesticides in paddy cultivation. This Case study was conducted to address the issues identified above, in the selected paddy fields in *the Gonnoruwa* area in the *Hambanthota* district. The proposed model use image processing techniques in combination with Convolutional Neural Networks to detect the pest's attacks in paddy cultivation by analyzing the symptoms. A set of self-captured images which were labeled with the help of domain experts were used to build and train the proposed model. The model has achieved 95% of accuracy while testing. The proposed model will be further improved to identify more pests and disease attacks in the future while delivering it as a handheld portable device where farmers can use it in real-time in their paddy fields which will lead to saving their time and money while increasing the paddy yield.

Keywords: Crop loss; Paddy; Pest and diseases; Pest identification model