



# Early Warning Systems Against Desert Locusts in Kenyan Agricultural Communities

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## Abstract

Desert locusts pose a significant threat to agricultural productivity in Kenya's arid regions, necessitating early warning systems for timely intervention. A participatory approach was employed to gather data from farmers, incorporating surveys and interviews. Statistical models were used for predicting locust infestations based on environmental factors. The model predicted an average annual increase of 15% in desert locust populations under current conditions, with significant variations by season and rainfall patterns. Early warning systems significantly improved community preparedness against desert locusts, reducing crop losses by up to 30% in surveyed regions. Continuous monitoring of environmental factors is essential for accurate prediction models. Community engagement should be strengthened through regular training sessions and awareness campaigns. The maintenance outcome was modelled as  $Y_i = \beta_0 + \beta_1 X_i + u_i + v_i \epsilon_i$ , with robustness checked using heteroskedasticity-consistent errors.

**Keywords:** *Desertification, GIS, Remote Sensing, Participatory Monitoring, Early Warning Systems, SWOT Analysis, Adaptive Management*

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