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REVIEWER'S REPORT

Manuscript No.: IJAR-56506

Title: Smart Pest Management: Empowering Andhra Pradesh's Smallholder Farmers with AI-Driven Crop Health Monitoring

Recommendation:
Accept as it is .....
Accept after minor revision.....
Accept after major revision .....
Do not accept (*Reasons below*) .....

Rating	Excel.	Good	Fair	Poor
Originality		✓		
Techn. Quality		✓		
Clarity			✓	
Significance	✓			

Reviewer's ID: JPR- 002

Detailed Reviewer's Report

The manuscript titled **"Smart Pest Management: Empowering Andhra Pradesh's Smallholder Farmers with AI-Driven Crop Health Monitoring"** explores the role of artificial intelligence (AI) technologies in improving pest management practices among smallholder farmers in Andhra Pradesh. The topic is timely and significant because digital agriculture and AI-based crop monitoring tools are increasingly being recognized as effective solutions for improving agricultural productivity and promoting sustainable farming practices.

The study aims to examine the effectiveness of AI-driven tools such as **Plantix** in detecting pest infestations, reducing pesticide usage, and improving crop productivity among small-scale farmers. The research adopts a **mixed-method approach**, combining quantitative survey data from **416 farmers** with qualitative insights obtained through interviews with farmers and agricultural extension workers. The study applies statistical techniques such as **descriptive statistics, regression analysis, t-tests, and ANOVA** to analyze the collected data.

The findings suggest that the adoption of AI tools has resulted in **significant reductions in pesticide usage (approximately 23%)**, **improved crop productivity (around 17%)**, and **better soil health conditions** among farmers who use AI-based pest management systems. The regression analysis indicates that **digital literacy and smartphone accessibility are the most important factors influencing the adoption of AI technologies**, while income level has a relatively weaker influence. The

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cost-benefit analysis further demonstrates that AI adoption provides strong financial advantages, with an estimated **return on investment (ROI) of approximately 115%**, making the technology economically viable for smallholder farmers.

The manuscript contributes to the growing body of literature on **digital agriculture and AI applications in pest management**, particularly in the context of developing countries. It also provides practical insights for policymakers, agricultural extension agencies, and technology developers regarding the promotion of AI tools in rural agricultural systems.

However, several improvements are required before the manuscript can be considered for publication. The manuscript contains **numerous grammatical and language errors**, which affect readability and clarity. Some sentences appear poorly structured or overly repetitive and require professional editing. Additionally, the **literature review could be strengthened by incorporating more recent empirical studies on AI adoption in agriculture**. The methodology section, although detailed, could benefit from clearer explanations regarding data collection procedures and sampling representation. Furthermore, some tables and figures require better formatting and clearer labeling.

Despite these issues, the research addresses an important topic and provides useful empirical insights into the adoption of AI technologies in agriculture. With revisions to improve **language quality, presentation, and methodological clarity**, the manuscript could make a valuable contribution to the field of **digital agriculture and sustainable farming**.