

REVIEWER'S REPORT

Manuscript No.: IJAR-58558

Title: A Time-Series Framework for Estimating the Lagged Impact of Crop-Residue Burning on PM_{2.5} Pollution in Delhi-NCR

Recommendation:

Accept as it is

Accept after minor revision.....

Accept after major revision

Do not accept (*Reasons below*)

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

Reviewer's ID: JPR-171

Detailed Reviewer's Report

This manuscript presents a timely and well-structured analysis of the temporal relationship between crop-residue burning in Punjab and PM_{2.5} pollution in Delhi-NCR over nine harvest seasons. The integration of NASA FIRMS satellite fire data with CPCB ground monitoring observations is appropriate, and the distributed-lag framework offers practical value for early-warning system development. However, several critical issues require major revision. Most significantly, the analysis relies exclusively on bivariate correlations without controlling for meteorological confounders wind speed, wind direction, boundary-layer height, and atmospheric stability that jointly determine both fire detectability and pollutant transport. This limitation substantially weakens the causal interpretation. The use of a single composite PM_{2.5} variable for "Delhi-NCR" masks considerable spatial heterogeneity across monitoring stations, and the manuscript would benefit from station-specific or zonal analyses. The proposed early-warning framework, while innovative, is not empirically validated in the current analysis. Additionally, the study does not adequately address the uncertainty in satellite fire counts, including cloud cover and overpass timing limitations. The literature review is comprehensive but would benefit from clearer articulation of how this work advances beyond previous machine-learning forecasting studies. With substantial revisions addressing these methodological concerns, including multi-variable modelling with meteorological covariates and spatial disaggregation of PM_{2.5} data, this manuscript could make a meaningful contribution to air-quality management in the region.