

REVIEWER'S REPORT

Manuscript No.: IJAR-59364

Title: Smart Environmental Monitoring for Saudi Mega-Projects: Integrating Digital Technologies with Environmental Compliance.

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 Id: JPR-297

Reviewer's Comment for Publication.

The manuscript addresses a highly relevant and timely topic by proposing a Smart Environmental Monitoring and Compliance Framework (SEMCF) for Saudi mega-projects in the context of Vision 2030, digital transformation, and evolving environmental compliance requirements. The paper demonstrates good interdisciplinary coverage by integrating IoT sensors, edge computing, BIM/GIS, digital twins, AI/ML, UAVs, secure data architectures, and environmental management systems into a coherent compliance-oriented framework. A major strength is that the manuscript does not treat technology as an end in itself, but appropriately emphasizes data quality, calibration, regulatory defensibility, human oversight, cybersecurity, accountability, and closed-loop corrective action. The discussion of dust and air quality, noise and vibration, water quality, waste, biodiversity, and cumulative impacts is particularly relevant to large-scale Saudi developments. The implementation roadmap and proposed KPIs also provide useful practical value for project owners, contractors, environmental consultants, and regulators. However, several minor revisions are recommended before publication. The methodology would benefit from a more transparent description of the literature-search strategy, databases/search terms, study-selection criteria, and the basis for selecting the eighteen core peer-reviewed studies, so that the review process is more reproducible. The authors should also carefully verify all Saudi regulatory and NCEC-related statements, dates, requirements, and references and ensure that the cited official sources directly support the claims made. The distinction between conceptual recommendations and currently mandated regulatory requirements should be made explicit throughout the manuscript to avoid potential overstatement. The proposed SEMCF is comprehensive, but its conceptual nature should be emphasized more consistently, and the relationship between the framework layers, compliance workflow, and the figures should be clarified to avoid overlap and improve visual coherence. Some sections could also be streamlined because several points concerning calibration, data

International Journal of Advanced Research

Publisher's Name: Jana Publication and Research LLP

www.journalijar.com

REVIEWER'S REPORT

quality, human oversight, and governance are repeated. The paper would further benefit from a more critical comparison with existing environmental-monitoring or digital-compliance frameworks and a clearer explanation of what is novel and uniquely applicable to the Saudi mega-project context. Finally, the authors should conduct a thorough language, formatting, table/figure numbering, and reference consistency check, including the presentation of citations and bibliographic details. Subject to these minor revisions, the manuscript makes a valuable conceptual and practical contribution and has good potential for publication.