

# Review of: "A QGIS Grid-Based Study to Understand the Relationship Between Land Surface Temperature and Greenness in Urban Areas"

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**Potential competing interests:** No potential competing interests to declare.

The manuscript explores the relationship between Land Surface Temperature (LST) and vegetation greenness (NDVI) in urban areas of Delhi. The topic is relevant and holds significant potential, especially given the growing importance of understanding urban heat islands and environmental sustainability. However, the manuscript falls short of the basic standards required for a research paper.

## 1. Structure and Content Issues

The overall structure of the manuscript is inadequate for a research paper. Key sections that are typically expected in scientific writing—such as a comprehensive introduction, a detailed literature review, and rigorous data analysis—are either underdeveloped or entirely missing.

**Introduction:** The introduction is overly brief and filled with abbreviations (such as QGIS, LST, and NDVI) that are not defined or explained clearly, which can confuse readers unfamiliar with the terms. This section should be expanded to include a proper explanation of the research context, significance, and objectives.

**Literature Review:** The manuscript lacks a dedicated review of relevant literature. A literature review is critical for grounding the research in the context of existing studies, especially given that similar analyses have been conducted in other cities or regions. The literature is only referenced superficially in the "Discussion and Conclusions" section, which is insufficient. A thorough comparison of methodologies and findings from other studies should be included.

## 2. Methodology

The methodology section is the longest part of the paper, but it is not appropriate for an academic research paper. The details provided are more akin to a step-by-step tutorial on using software than a methodological framework for scientific analysis. For instance, the instructions for creating scatter plots and calculating correlations resemble a basic software guide rather than an explanation of research methods. Here is an excerpt from the manuscript's methodology:

" 6. Scatter plot and correlation between the two variables

a. The new shape file named 'LST\_NDVI\_Features' will be added to the canvas

- b. Open the attribute table 'LST\_NDVI\_Features'
- c. Click Select all, and 'copy selected rows to clipboard'
- d. Paste it into an Excel file
- e. Delete all the columns except the last two (which are LST and NDVI values)
- f. Now, using the LST and NDVI values, make a scatter plot and calculate the correlation
- g. Add horizontal and vertical axes as LST and NDVI, respectively
- h. Change the minimum and maximum values of LST to 22 and 32, respectively
- i. Add a Chart Title
- j. Observe and comment on the correlation"

These types of instructions are unnecessary for inclusion in a research paper and are more appropriate for high school-level projects. The methodology section should focus on explaining the reasoning behind the chosen methods, the statistical approaches employed, and the data sources used, rather than providing step-by-step software instructions.

Also, a shortcoming of the manuscript is the lack of rigorous statistical analysis. While the authors use linear regression to examine the relationship between LST and NDVI, they fail to provide key statistical tests necessary to confirm the validity of their findings. For instance:

There are no tests for the significance of the regression coefficients, making it impossible to assess whether the observed relationship is statistically meaningful.

In Figure 3, there appears to be an influential point (22.8, 0.6) that may skew the results of the regression, yet this issue is not discussed or addressed by the authors.

A more in-depth statistical treatment, including tests for regression assumptions, residual analysis, and potential use of non-linear models, should be included to strengthen the research findings.

### 3. Technical and Formatting Issues

The references section is inadequately prepared. Several key formatting issues need to be addressed:

Many references lack DOI numbers, which is standard in academic writing for tracking and accessibility.

In some places, numbers such as "1,2" appear next to author names, which seems to be a formatting error or misplaced citations.

Furthermore, the authors cite literature dealing with similar research in other regions but fail to provide a comparative analysis of the methodologies and results. This missing comparison weakens the manuscript's scientific contribution.

## Conclusion:

While the topic of the manuscript is relevant, the paper does not meet the necessary standards for publication. Significant revisions are required, including a more developed introduction, a proper literature review, the removal of unnecessary methodology steps, and the inclusion of rigorous statistical analysis. Addressing the technical and formatting issues in the references is also needed.