

REVIEWER'S REPORT

Manuscript No.: IJAR- 58915

Title: ASSESSING THE GROWTH OF URBAN AGRICULTURE AND POTENTIALITY OF GREEN MANAGEMENT FOR GREEN CITY MODEL IN JHARGRAM MUNICIPALITY, WB, INDIA.

Recommendation:

Accept as it is

Accept after Major revision.....

Accept after Minor revision

Do not accept (*Reasons below*)

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

Reviewer Name: **ANAPANA GOPAL**

Reviewer's Comment for Publication.

General Comments

The manuscript entitled “**Assessing the Growth of Urban Agriculture and Potentiality of Green Management for Green City Model in Jhargram Municipality, WB, India**” addresses a relevant interdisciplinary topic linking urban agriculture, land use, water management, environmental sustainability, and green-city planning. The study combines questionnaire surveys, field observations, interviews, focus-group discussions, municipal/secondary information, and geospatial indices to assess the current status and future potential of urban agriculture in Jhargram.

The manuscript has practical relevance, particularly because it identifies household, academic, health, and industrial-sector participation in urban agriculture and proposes rooftop farming, hydroponics, rainwater harvesting, micro-irrigation, composting, and technology-based management as possible interventions.

However, the manuscript requires **Minor revision** before it can be considered for publication. The Minor concerns are the **lack of sufficient methodological detail, unclear sampling framework, absence of quantitative analysis supporting several conclusions, errors in the remote-sensing formulas, insufficient documentation of data sources, overinterpretation of survey findings, and substantial language and presentation problems.**

Content and Originality

The manuscript has a potentially useful applied focus. The reported finding that **81% of surveyed households participate in domestic agriculture** is interesting and provides a useful starting point for understanding urban agriculture in Jhargram.

The study also attempts to go beyond simply documenting urban gardening by considering:

- rooftop farming;
- hydroponics;

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- cocopeat-based cultivation;
- rainwater harvesting;
- composting;
- vertical gardening;
- smart irrigation;
- institutional agriculture; and
- integration of urban agriculture into future municipal planning.

However, the **scientific originality is not sufficiently established**. Much of the manuscript consists of general recommendations about urban agriculture that are already widely discussed in the literature. The authors should clearly identify what is novel about the Jhargram case.

The manuscript should answer a more specific question such as:

What new empirical evidence does this study provide about the scale, constraints, spatial distribution, and management potential of urban agriculture in Jhargram Municipality?

At present, the manuscript moves between a **survey of urban agriculture**, a **land-use/remote-sensing study**, and a **green-city planning proposal**, without fully integrating these three components.

The authors should therefore define a clear central research question and demonstrate how each dataset contributes to answering it.

Technical Quality

1. Sampling design needs substantial clarification

The manuscript states that the study involved **100 households, 20 apartments, 20 shops/restaurants/malls, 10 health centers, 10 institutions, and 10 offices**, using random sampling.

However, several important details are missing:

- How were the 18 wards sampled?
- How many respondents/units were selected from each ward?
- Was the sampling proportional to ward population?
- How were households selected?
- Who completed the questionnaire?
- Were the respondents household heads or individual residents?
- How were apartments, offices, institutions, and health centers selected?
- What were the inclusion/exclusion criteria?
- What was the questionnaire validation procedure?

The manuscript should provide a clear sampling framework and preferably a table showing **ward-wise sample distribution**.

2. Internal terminology regarding the study area should be corrected

The study is described as being conducted in **Jhargram Municipality**, but the Methods repeatedly refer to **"Jhargram district."**

These are geographically different administrative units. The manuscript must consistently distinguish between:

- Jhargram Municipality;
- Jhargram town; and
- Jhargram District.

If the actual survey was conducted only within the municipality, the term **"Jhargram Municipality"** should be used throughout the study.

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3. Sample sizes do not correspond clearly to the reported percentages

The manuscript reports 81% household participation in domestic agriculture.

If this percentage is based on the 100 surveyed households, the denominator is clear. However, the manuscript should explicitly state **n = 100** whenever percentages are reported.

For other sectors, the denominators should also be given. For example, the academic sector findings appear to be based on **10 institutions**, while the industrial findings appear to be based on **10 offices/industries**.

Percentages from very small samples should be interpreted cautiously.

4. Statistical analysis is insufficient

The manuscript describes quantitative techniques and percentages but does not provide an adequate statistical methodology.

There is no clear information on:

- statistical software;
- confidence intervals;
- hypothesis testing;
- association tests;
- sampling error;
- significance testing;
- treatment of missing responses.

For a survey-based study, the authors should consider appropriate analyses such as **chi-square tests or other suitable categorical-data analyses**, where scientifically justified.

At minimum, the number of observations (**n**) should accompany each percentage.

5. Remote-sensing methodology contains apparent formula errors

This is a Minor technical issue.

The manuscript gives the NDVI formula as:

$$\text{NDVI} = (\text{NIR} - \text{Red})/(\text{NIR} + \text{Red})$$

which is appropriate in general.

However, the presentation of the NDBI formula contains a typographical/technical error, showing **"SWIT + NIR"** in the denominator rather than the expected formulation.

More importantly, the MNDWI equation is presented as:

$$\text{MNDWI} = (\text{Green} - \text{SWIR})/(\text{Green} - \text{SWIR})$$

which would mathematically simplify to 1 wherever the denominator is non-zero and therefore cannot be the intended water-index equation.

This formula must be corrected and the actual formula used in the analysis clearly stated.

6. Remote-sensing data sources are inadequately documented

The manuscript presents an NDVI map for Jhargram Municipality for **2025** and a land-use-change figure for **2020–2025**, but the source, satellite platform, acquisition dates, spatial resolution, preprocessing, and classification procedure are not adequately described.

The authors should state:

- satellite/sensor used;
- image acquisition dates;
- spatial resolution;
- cloud-cover criteria;

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- preprocessing;
- atmospheric correction, if applicable;
- classification method;
- software used;
- accuracy assessment;
- training/validation data, if supervised classification was performed.

Without these details, the remote-sensing results cannot be reproduced.

7. The land-use-change figure is insufficiently explained

The manuscript presents “**Land Use Change (2020–2025)**”, but the figure does not clearly identify the corresponding land-use categories in the parsed text.

The reader needs to know:

- what each bar represents;
- the original area in 2020;
- the area in 2025;
- percentage change;
- methodology used to calculate the change.

A table containing the underlying land-use data would substantially improve transparency.

8. NDVI map requires interpretation and validation

The NDVI map is presented as an existing vegetation map, but the manuscript does not explain the classification thresholds or how the categories were interpreted.

The authors should provide:

- NDVI minimum and maximum values;
- threshold ranges;
- meaning of each class;
- area covered by each class;
- percentage contribution of each class.

The map should also contain an appropriate **source, projection/coordinate information, scale, north arrow, legend, and date.**

9. The “green city” conclusion is broader than the evidence

The manuscript concludes that Jhargram can become a model of eco-friendly urban living through urban agriculture.

This is a reasonable policy aspiration, but the study does not actually measure:

- urban heat-island reduction;
- air-quality improvement;
- carbon sequestration;
- biodiversity enhancement;
- waste-reduction quantities;
- groundwater recharge;
- food production volume;
- household nutritional outcomes.

Therefore, these should be described as **potential benefits**, rather than demonstrated outcomes of the present study.

10. Some recommendations are presented as established requirements without evidence

The manuscript recommends that rainwater harvesting and wastewater recycling “**must be introduced and made mandatory**” in larger institutions.

Such policy recommendations require stronger justification, including:

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- current regulatory framework;
- institutional feasibility;
- water-quality considerations;
- cost;
- maintenance;
- health and safety requirements.

The recommendation should be expressed more cautiously unless supported by policy analysis.

11. Wastewater use requires particular caution

The manuscript identifies wastewater/grey-water use as a potential irrigation source. However, no water-quality analysis is presented. The manuscript should distinguish **treated greywater** from untreated wastewater and discuss potential risks involving:

- pathogens;
- salts;
- detergents;
- heavy metals;
- other contaminants.

The current wording may unintentionally suggest that wastewater can generally be used safely for food production.

12. “Hybrid plants” recommendation is insufficiently justified

The manuscript recommends cultivation of “low-maintenance and hybrid plants” to increase production in small spaces.

This is a broad recommendation without supporting experimental evidence from the study. It should either be supported with appropriate literature or removed.

13. Household data need stronger interpretation

The manuscript reports that **47% of households use less than 100 sq ft**, 21% use 100–300 sq ft, and 23% use 300–600 sq ft.

These data are useful, but the manuscript should explain:

- whether these areas were measured or self-reported;
- whether they refer to cultivated area only;
- how apartment and independent-household data were separated;
- whether differences among groups were statistically tested.

14. Water-use findings need more detailed analysis

The manuscript reports tap water as the principal water source and manual irrigation as the dominant irrigation system.

These are important findings, but the study does not quantify:

- water consumption;
- frequency of irrigation;
- seasonal variation;
- water availability;
- irrigation cost.

Therefore, claims regarding improved water efficiency from proposed drip systems remain prospective rather than empirically demonstrated.

Language and Presentation

The manuscript requires **substantial English-language editing and professional copy-editing**.

There are frequent grammatical and stylistic problems, including:

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- “potentiality” is repeatedly used where **“potential”** would be more natural.
- “To enquiry the critical factors” should be rewritten as **“To examine the critical factors.”**
- “Others prime objectives” should be **“Other primary objectives.”**
- “To encourage among urban people for food security” requires complete grammatical restructuring.
- “which distance from the capital of Kolkata is around 170 km” is grammatically incorrect.
- “90% of institutions” and other percentages need explicit denominators.
- “student’s sustainability” should be corrected to **“students' understanding of sustainability.”**

There is also excessive repetition. The same recommendations regarding:

- rooftop gardening;
- rainwater harvesting;
- automated irrigation;
- hydroponics;
- technology;
- composting

appear in the Abstract, Introduction, Potentiality, Recommendations, and Conclusion. The manuscript should be substantially shortened and consolidated.

Structure and Organization

The manuscript has a recognizable structure, but its organization needs improvement.

Introduction

The Introduction contains useful background but is too descriptive and repetitive. It should establish:

1. the problem;
2. existing knowledge;
3. knowledge gap;
4. study area justification;
5. research questions/objectives.

The Abstract and Introduction currently contain many of the same recommendations.

Study Area

The geographical description is extensive, but some information appears unrelated to the specific research question, such as historical and cultural details.

The section should focus more on:

- urban extent;
- population;
- land use;
- rainfall;
- temperature;
- water availability;
- soil;
- urbanization characteristics;
- agricultural context.

Methodology

This is the section that most urgently requires strengthening.

The authors should clearly separate:

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A. Survey methodology

B. Geospatial/remote-sensing methodology

C. Data analysis

At present, the three approaches are combined without enough methodological detail.

Results

The Results section should contain the actual empirical findings, supported by:

- tables;
- sample sizes;
- percentages;
- statistical tests;
- maps;
- quantitative land-use measurements.

The current Results are predominantly descriptive.

Discussion

A separate Discussion section would improve the manuscript. The authors should compare their findings with previous urban-agriculture studies and explain why Jhargram differs from or resembles other cities.

Recommendations

The recommendations are extensive but should be prioritized according to the evidence obtained from the survey.

References and Citations

The reference list contains several useful sources on urban agriculture, food security, environmental sustainability, and urban planning.

However, the references require substantial improvement.

1. **Several claims in the manuscript are not directly supported by citations.** For example, claims about green nets protecting plants from pests and harsh weather, hydroponics using less water, and rooftop gardens reducing building energy costs require appropriate references.
2. The manuscript uses **Google Scholar, ScienceDirect, and ResearchGate as "secondary data" sources.** These are primarily platforms/databases rather than original data sources. The authors should cite the original publications or official datasets instead.
3. The statement concerning current population of approximately **95,000** should have a clearly identified official source. The manuscript contrasts this with the 2011 Census figure of 61,682.
4. The manuscript cites **United Nations (2018)** for the urban-population projection. The exact source should be provided consistently in the reference list and cited appropriately.
5. The references related to remote sensing should be checked carefully, particularly **Tucker et al. (2001), Zha et al. (2003), He et al. (2010), and Xu (2006)**, and the equations should correspond exactly to the cited sources.
6. The final reference, a **2025 dissertation concerning carbon emissions and urban heat-island zones in Jhargram Municipality**, should be fully formatted and its relevance clearly explained.
7. Reference formatting should be standardized throughout.

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Overall Recommendation

The manuscript has **good local relevance and useful descriptive information** about urban agriculture in Jhargram Municipality. The survey findings indicate substantial household participation, with **81% of surveyed households reportedly engaged in domestic agriculture**, while the academic sector also shows significant involvement in cultivation.

The manuscript's major strength is its attempt to integrate **social survey information, urban agriculture practices, water management, land-use/vegetation analysis, and future green-city planning**.

However, in its present form, the study is more appropriately considered a **descriptive exploratory assessment** than a fully developed quantitative urban-agriculture or geospatial study. The authors need to substantially strengthen the methodological foundation before making broad conclusions about Jhargram's transformation into a green city.

Final Decision:

Minor Revision

The manuscript addresses a **relevant and potentially publishable topic**, particularly from a local urban-planning and sustainability perspective. However, substantial methodological, analytical, and presentation revisions are necessary. The authors should particularly correct the **remote-sensing methodology/equations**, strengthen the survey design and statistical analysis, provide verifiable data sources, and ensure that conclusions and recommendations remain proportional to the evidence actually generated by the study