



REVIEWER'S REPORT

Manuscript No.: IJAR- 56213

Title: Ecological Cooling Network Planning for the Bonifacio Global City Watershed Through Biotope Mapping

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 Name: **ANAPANA GOPAL**

Reviewer's Comment for Publication.

General Comments

This manuscript examines the ecological and thermal structure of the 979.12-hectare Bonifacio Global City (BGC) sub-watershed in Metro Manila and proposes an Ecological Cooling Network Plan based on biotope mapping and land surface temperature (LST) analysis. The study addresses an important and timely issue: the intensification of Surface Urban Heat Island (SUHI) effects in highly urbanized districts. The integration of watershed-scale analysis with biotope classification and cooling network planning is appropriate for a landscape architecture and urban ecological planning journal.

Overall, the study demonstrates a clear planning orientation and offers a spatially explicit framework for cooling network development. The use of GIS and remote sensing data is suitable for the study's scope. However, the manuscript would benefit from stronger methodological clarity, deeper analytical rigor, clearer integration between LST results and biotope scoring, and improved academic writing precision. The paper has merit and is suitable for consideration after moderate revisions.

Content and Originality

The study contributes to the growing literature on:

- Urban heat island mitigation
- Biotope mapping in dense urban districts
- Ecological network planning
- Nature-based cooling strategies

The originality lies in:

1. Applying a biotope-based ecological assessment specifically for cooling network planning in BGC.
2. Framing SUHI analysis within a watershed-scale ecological structure.
3. Translating D-A-R-H biotope scoring into management categories (Creative, Improvement, Conservation, Preservation).

However, several aspects could strengthen originality:

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- The manuscript does not clearly demonstrate how this study advances beyond previous Philippine-based biotope or cooling studies.
- The D-A-R-H framework is adapted, but the justification for how it directly correlates with thermal performance is not fully articulated.
- The LST results are presented descriptively; stronger quantitative linkage between LST patterns and biotope categories would enhance contribution.

The planning proposals are practical but remain conceptually generalized. More spatial specificity (e.g., quantified corridor lengths, target canopy percentages, cooling intensity gradients) would improve scholarly depth.

Technical Quality

The technical framework is generally appropriate but requires refinement in several areas.

Strengths:

- Clear watershed delineation using DEM data.
- Use of Landsat 8/9 thermal bands for LST mapping.
- Systematic overlay of soil, landform, and land cover to generate 21 biotopes.
- Transparent D-A-R-H scoring system.
- Structured management classification with defined score ranges.

Areas for Improvement:

1. LST Methodology Details

- The manuscript does not describe:
 - Date(s) of Landsat acquisition
 - Atmospheric correction method
 - Emissivity assumptions
 - Conversion formula used to derive LST
- Without these, reproducibility is limited.

2. Thermal Range Interpretation

- The LST range (37.08°C–38.91°C) is narrow (~1.8°C difference).
- The study should clarify:
 - Whether this represents annual mean daytime LST.
 - If seasonal variability was considered.
 - Whether statistical analysis (e.g., mean comparison per biotope type) was conducted.

3. Link Between Biotope Scores and LST

- The scoring framework is ecological, but cooling value is assumed rather than statistically demonstrated.
- A table comparing average LST per biotope category would significantly strengthen the technical argument.

4. Weighting of D-A-R-H Criteria

- All criteria are equally weighted, but no justification is provided.
- Is Habitat more influential on cooling than Rarity?
- A sensitivity analysis or justification is needed.

5. Scale Limitations

- High-rise urban morphology (urban canyon effects) is acknowledged but not incorporated analytically.
- Vertical shading and building density are not quantified.

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6. Network Modeling

- The cooling network is conceptual rather than modeled.
- No connectivity metrics (e.g., least-cost path, graph theory indices, corridor width thresholds) are calculated.

Overall, the technical approach is sound for a planning-oriented study but requires stronger methodological transparency and analytical depth.

Language and Presentation

The manuscript is generally readable and organized, but several issues should be addressed:

Language Concerns:

- Minor grammatical inconsistencies (e.g., “its infiltration potential becomes limited” → “their infiltration potential becomes limited” when referring to soils).
- Occasional awkward phrasing.
- Some redundancy in introduction and results sections.
- Inconsistent spacing (e.g., “Magnaye&Kusaka” should be “Magnaye & Kusaka”).

Presentation Strengths:

- Clear subheadings.
- Logical progression from maps to assessment.
- Tables are structured and understandable.
- Management categories are clearly defined.

A careful language edit for conciseness and academic tone would improve clarity.

Structure and Organization

The structure is coherent and appropriate for a design and planning journal:

1. Introduction (background, challenges, goals)
2. Methodology
3. Results and Analysis
4. Conclusion

Strengths:

- Clear research goals.
- Logical methodological flow.
- Results structured by map type.

Improvements needed:

- The Results section sometimes blends description with interpretation.
- The LST section should be more analytically integrated with the biotope assessment.
- The Discussion could be expanded to interpret implications beyond the site (policy relevance, scalability).
- The hypothesis stated in Section 1.4 is not explicitly tested; it should be reframed or removed.

International Journal of Advanced Research

Publisher's Name: Jana Publication and Research LLP

www.journalijar.com

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References and Citations

The references are recent and relevant, particularly:

- Sustainable Cities and Society
- Remote Sensing
- Nature Cities
- ISPRS Annals

Strengths:

- Current literature (2024–2025).
- Strong regional relevance.
- Inclusion of Philippine-based studies.

Minor issues:

- Jarvis & Young (2005) reference appears incomplete.
- Formatting inconsistencies (spacing around ampersands).
- Ensure all DOIs are accurate and accessible.

Overall, references are appropriate and strengthen credibility.

Overall Recommendation

This manuscript addresses an important urban heat issue in a highly relevant metropolitan district. The planning framework is well structured, and the spatial outputs are suitable for publication in a landscape architecture or ecological planning journal.

However, before acceptance, the manuscript requires:

- Expanded methodological explanation for LST derivation.
- Stronger analytical linkage between LST and biotope scoring.
- Justification of D–A–R–H weighting.
- Minor language revision.
- Slight expansion of discussion to emphasize contribution and replicability.

Final Decision:

Minor to Moderate Revision

The study is suitable for publication after methodological clarification, analytical strengthening, and minor editorial refinement.