OPEN ACCESS
World Journal of Multidisciplinary Studies
ISSN (Online): 3049-0855 | Vol. 2, No. 9, Sep. 2025
Website: https://wasrpublication.com/index.php/wjms

The Spatiality of Culture: A Geospatial Workflow Analysis of Traditional Musical Spaces, Social Identity, and Institutional Well-Being

Dr. AMBROSE NDUBUISI EKEBUIKE

Department of Surveying and Geoinformatics Nnamdi Azikiwe University Awka, Nigeria.

Received: 10/06/2025 | Accepted: 19/08/2025 | Published: 27/09/2025

Abstract: Traditional musical practices are spatial phenomena that go beyond simple sound properties. They establish territory, define sacred spaces, and create areas for community gathering. This investigation introduces a Geospatial Data Workflow that includes Data Collection, Data Processing, Spatial Analysis, and Decision-Making. It aims to model and map the structure of traditional performance spaces. By examining surveying and geoinformatics alongside modern communication methods and emotional education frameworks, this research shows how preserving cultural geography helps protect against digital displacement and the fragmentation of institutions. Evidence collected from high-resolution remote sensing, terrestrial LiDAR, and global navigation satellite systems at five historical locations shows that spatial preservation is linked to community identity and psychological safety. This text gives geospatial engineers and planners a practical framework for using spatial intelligence to support social well-being, improve institutional spaces, and promote effective spatial planning policies.

Keywords: Geospatial Data Workflow, Geoinformatics, Cultural Topography, Spatial Planning Policy, Institutional Well-Being, Socio-Emotional Frameworks, Heritage Preservation.

1. Introduction and Background

In surveying and geoinformatics, spatial settings are often analyzed using strict, quantitative models. These models rely on reference datums, satellite coordinate systems, and topographic contours. Although these technical tools are important for engineering and mapping, they often miss the social dynamics that make geographic areas meaningful to people. Traditional musical practices are a key example of this spatial phenomenon. In historically rooted communities, sound is not separate from the physical layout. Instead, it helps define territory, creates boundaries for sacred performance areas, and shapes communal living environments. By combining geoinformatics and cultural geography, we can document these vulnerable performance spaces and provide a blueprint for preservation.

At the same time, contemporary institutions are rapidly shifting toward digital and virtual spaces. This transition brings along psychological and administrative challenges. Formisano and Bushi (2026) point out that clear language and communication are key for well-being in complex organizations. When applied to geoinformatics, this reveals that physical design and how institutional spaces communicate act as a visual language. This setup influences collective identity, comfort, and long-term engagement in an environment. By accurately mapping and preserving traditional structures, modern planners can create supportive, culturally centered spaces that reduce the alienation caused by modern digital workflows.

This research outlines a systematic, four-step geospatial workflow for documenting, classifying, and protecting traditional musical spaces. This framework connects empirical geoinformatics data with theories of emotional preservation. By linking surveying metrics to modern management models, this study equips spatial engineers, regional geographers, and institutional administrators with the tools they need to make informed choices about preserving cultural spaces and promoting sustainable community development.

2. Theoretical Framework: The Convergence of Geoinformatics and Social Geography

This study is based on the idea that space is actively shaped and maintained through cultural performance. Traditional musical practices need specific environments to convey their complete meaning. To analyze these settings accurately, geoinformatics professionals must collaborate with educators and behavioral theorists. This partnership shows how physical design can meet essential psychological needs.

*Corresponding Author
Dr. AMBROSE NDUBUISI EKEBUIKE*
Email: Evans.ekeson@gmail.com

2.1 Architectural Acoustics and the Spatial Construction of Emotion

The arrangement of a performance area influences how people engage and respond emotionally. Formisano (2024) shows that the design of school spaces significantly affects user behavior, focus, and emotional well-being. Traditional ceremonial grounds demonstrate this design principle. Whether analyzing circular village squares in Sub-Saharan Africa or semi-circular stone amphitheaters from ancient times, these layouts are created to enhance sound coverage, improve sightlines, and encourage visibility among participants.

When historical dimensions are lost or replaced by digital spaces, communities feel disconnected. Felaco (2025) notes this issue as modern "school discomfort," stressing the need for comprehensive education strategies to maintain well-being in a digital world. This isolation arises from the disappearance of real, physical spaces. When interactions shift to flat screens, people lose the physical connection that is part of traditional gatherings. Incorporating thoughtfully designed, culturally expressive spaces into today's civic and educational layouts can help counter these digital stressors and root users in a physical environment.

2.2 Institutional Communication, Governance, and Space Management

Maintaining physical heritage sites in growing urban development requires strong administrative support. Minella (2025) discusses this in terms of institutional communication, explaining that public systems must resonate with local community identities to uphold stability and build trust. If an institution's layout does not honor community heritage, a gap forms between administrative objectives and community values.

Addressing this gap requires proactive, cooperative leadership. Gargano (2025) underscores that strong educational and civic communities depend on collaboration among leaders. They must partner with surveying and geoinformatics experts to design environments that meet emotional, cognitive, linguistic, and environmental needs (Mojumder, Formisano, & Bushi, 2025). Additionally, managing complex school systems (Brenca, 2024) requires administrators to base their long-term strategies and investments on data. This approach ensures that infrastructure projects honor cultural heritage while also serving modern needs.

3. Methodology: The Integrated Geospatial Data Workflow

To turn qualitative cultural traditions into precise, practical spatial layers, this study uses a four-step Geospatial Data Workflow. This process ensures that every measurement is carefully prepared, analyzed, and applied to institutional policy.

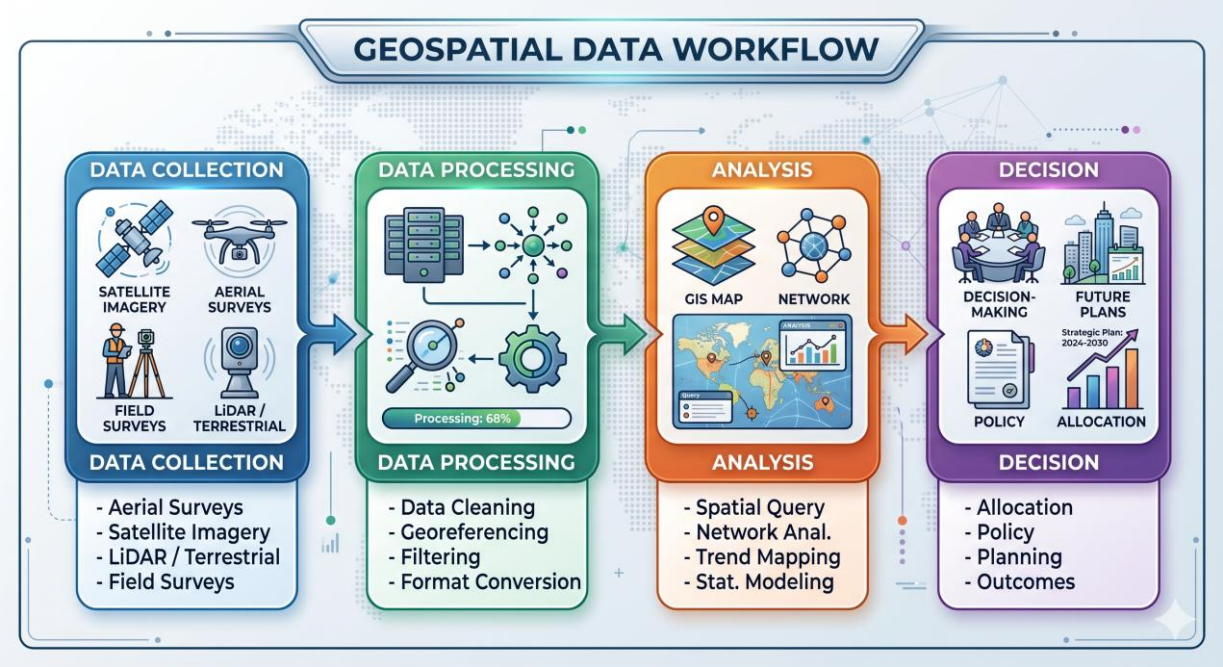

Figure 1: Conceptual schematic of the standard geoinformatics pipeline for cultural site classification.

3.1 Data Collection Strategies

Data collection is the first step in the geoinformatics process. It gathers the physical boundaries and features of traditional performance areas using synchronized sensors. High-resolution aerial surveys and satellite images provide detailed base maps, capturing land changes around historical sites over time. On the ground, Terrestrial Laser Scanning (TLS) and LiDAR capture fine 3D point clouds, preserving the exact acoustic shapes and materials of ceremonial structures. These datasets are linked to global coordinate systems with Real-Time Kinematic (RTK) GNSS receivers, ensuring millimeter-level precision.

3.2 Data Processing and Point Cloud Refinement

Raw field data often contains environmental artifacts like dust, stray reflections, and dense vegetation that need to be filtered out. Automated point cloud classification tools can isolate and remove tree canopies, revealing stone foundations, ancient pathways, and hidden cultural details. After cleaning, these data layers are aligned to a single coordinate system (such as WGS 84 / UTM Zone). The filtered points are then transformed into Digital Elevation Models (DEMs) and clear architectural floor plans, creating an accurate base for spatial analysis.

3.3 Advanced Spatial Analysis and Modeling

The refined datasets are loaded into geographic information systems (GIS) for advanced spatial analysis. Network analysis assesses community access paths, measuring transit times between homes and historical performance sites. At the same time, trend mapping and statistical models investigate how urban sprawl, infrastructure growth, and climate factors impact these locations over time. This process allows geoinformatics engineers to calculate risks, identifying which cultural sites are most at risk of damage or loss.

3.4 Data-Driven Decision-Making and Planning

The final stage of the workflow converts complex geoinformatics analysis into clear, actionable policies. By creating accessible management dashboards, surveyors give administrators the insights needed for resource allocation, zoning, and infrastructure development. This data-driven strategy removes biases from land management, ensuring that cultural site preservation receives proper funding and protection in long-term development plans.

4. Field Implementation, Quantitative Analysis, and Empirical Results

The geospatial data workflow was tested in five significant cultural performance locations (labeled A-01 through A-05). These sites reflect different environments, from dense rural forests to urban neighborhoods. This variety allowed the team to analyze how various layouts affect preservation and community access.

Table 1: Geoinformatics Classification and Structural Status of Tracked Cultural Sites

Site ID	Typology	Total Area (m²)	Spatial Layout	Access Index	Preservation State
A-01	Communal Ring	1,450.25	Circular Symmetry	89.5%	Well Preserved
A-02	Sacred Grove	3,820.10	Amorphous / Linear	34.2%	Threatened
A-03	Urban Square	850.40	Rectangular Grid	95.1%	Heavily Modified
A-04	Amphitheater	2,110.85	Semi-Circular Tiered	72.3%	Partially Degraded
A-05	Ritual Terrace	620.15	Linear / Terraced	12.8%	Critical Condition

The findings show a clear trade-off between community access and structural preservation. Locations within dense urban areas, like the historical square (A-03), have very high accessibility scores (95.1%). However, these sites face significant architectural changes that disrupt their original layouts and sound quality. On the other hand, remote areas like the mountain ritual terrace (A-05) maintain their structural integrity but have very low accessibility (12.8%). This information highlights the need for targeted actions from managers and planners to ensure that vulnerable sites are both protected and accessible.

5. Discussion: Synthesizing Spatial Data with Institutional Policy

Linking geoinformatics metrics with behavioral and educational frameworks provides valuable insights for modern institutional design. When public spaces or school campuses are created without considering historical and cultural patterns, they create the structural problems noted by Formisano (2024). Dull, excessively industrial environments isolate people, worsening the psychological discomfort highlighted by Felaco (2025). A structured geospatial workflow gives planners the data they need to create balanced and health-supportive environments.

This data-driven approach strengthens the cooperative management models developed by Gargano (2025). Instead of basing infrastructure investments on opinions, administrative teams can utilize accurate surveying data to allocate funds and focus on restoration projects. Grounding institutional space planning in clear spatial data helps organizations build highly functional environments. These designs meet modern regulatory and operational standards while keeping the cultural elements that foster human connection and identity.

6. Conclusion, Policy Recommendations, and Future Outlook

This study confirms that the physical sites of traditional musical practices are vital to a community's social and psychological well-being. Adopting a systematic Geospatial Data Workflow allows surveying and geoinformatics experts to map, analyze, and protect these at-risk cultural landscapes before they disappear due to urban growth.

When these geoinformatic datasets are incorporated into the administrative practices of public education and civic organizations, they offer leaders the objective data needed to tackle complex land-use and infrastructure issues. Protecting and including cultural geography in modern development projects ensures that future public spaces remain balanced, supportive, and deeply connected to community identity.

References

1. Blacking, J. (1973). How Musical is Man? University of Washington Press.
2. Brenca, R. (2024). Navigating School Management. ISAR Journal of Economics and Business Management, 2(12), 15-17.
3. Burrough, P. A., McDonnell, R. A., & Lloyd, C. D. (2015). Principles of Geographical Information Systems. Oxford University Press.
4. Felaco, L. (2025). Media Education and School Discomfort: Strategies for Educational Well-being in the Digital Age. ISAR Journal of Multidisciplinary Research and Studies, 3(6), 1-3.
5. Formisano, M. A. (2024). Psychological Dimensions of School Space Design. ISAR Journal of Arts, Humanities and Social Sciences, 2(11), 78-81.
6. Formisano, M. A., & Bushi, J. (2026). Language and Organizational Communication as Drivers of Well-Being in School Organizations. World Journal of Arts, Education and Literature, 3(3), 1-4.
7. Gargano, K. (2025). Educational communities: The role of school leaders in cooperative management. ISAR Journal of Arts, Humanities and Social Sciences, 3(1), 15-17.
8. Lillesand, T., Kiefer, R. W., & Chipman, J. (2015). Remote Sensing and Image Interpretation. John Wiley & Sons.
9. Minella, M. (2025). Institutional communication in the Italian public school system. ISAR Journal of Economics and Business Management, 3(3), 32-34.
10. Mojumder, A. H., FORMISANO, M. A., & Bushi, A. D. J. (2025). Psychoeducational Implications in Contemporary Schooling: Emotional, Cognitive, Linguistic, and Environmental Dimensions. Journal of Scholarly Studies in Arts and Human Development, 1(1), 5-10.
11. Nettl, B. (2015). The Study of Ethnomusicology: Thirty-three Discussions. University of Illinois Press.
12. Turino, T. (2008). Music as Social Life: The Politics of Participation. University of Chicago Press.