Urgent Documentation and Preservation Strategies for Kerala's Outdoor Temple Murals: Challenges and Case Studies

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Background

Ramapattabhishekham **(from the Ramayana),~18th c. CE**
Thrikodithanam Mahavishnu Temple, Kottayam

Kerala, in South India, is home to a rich tradition of outdoor temple murals (7th c. CE – present day), most often painted on lime plaster over stone or masonry walls. These murals, depicting mythology, folklore, and everyday life, represent an extraordinary confluence of art, culture, and spirituality.[1,2]

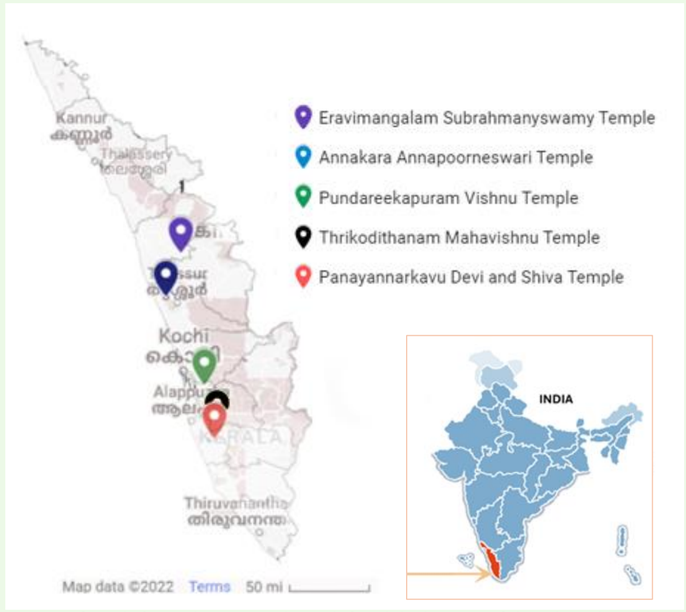
Exposed to a hot, humid climate, many murals are deteriorating rapidly. Repainting over older, faded murals and the demolition or rebuilding of temple structures, although culturally meaningful, pose additional threats to the original materials. Timely, systematic documentation using scalable, database-driven strategies including high-resolution images, metadata, and 3D models, is essential to preserve knowledge, support future research, and inform conservation efforts.[3]

Research Questions

What factors influence the conservation of Kerala murals? How can sustainable preservation strategies, both technical and community-focused, be developed to protect these and other murals in Kerala?

Methods

- Five temples selected for unrestored materials, mix of well- and lesser-known sites, and accessibility.
- Study combined art historical, archival, and scientific approaches.
- Documentation included digital photography, photogrammetry, Infrared Reflectography, raking light, digital microscope and thermal imaging, plus environmental monitoring (temperature and relative humidity).
- Non-invasive scientific techniques for material characterization included Hyperspectral imaging and Fiber Optic Reflectance Spectroscopy (FORS).[4]



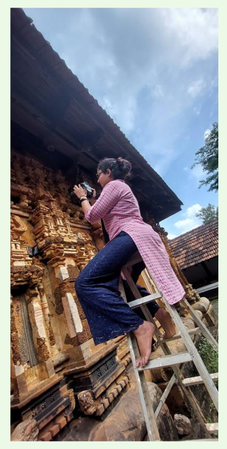
Map of Kerala (Inset: location within India) and the location of the selected temples

Challenges

- Lack of existing network
- Access: Limited permissions, time restrictions, off-limits areas.
- Site-specific Restrictions: No supplementary light or radiation allowed; photography of deity idols prohibited.
- Practical difficulties: Obstructed views, tripod limits, ladder use, demanding conditions.

Adaptation for Restrictions: Using best data from selected techniques carried out under such constraints.

Objects in the way of imaging

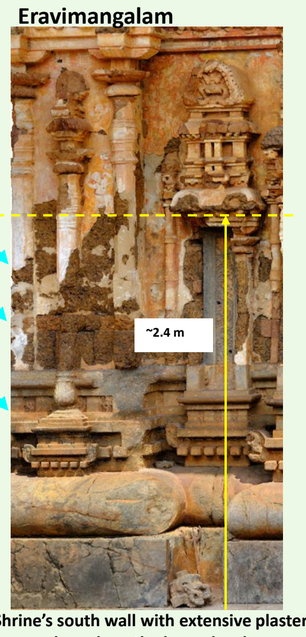


No way to support tripod at times

Results – Case Studies

- All murals were documented and assessed for condition. Sites showed varying stages of deterioration.
- The least known temple in Eravimangalam faced the highest climate-related threats and not had many conservation interventions. However, original historical material is preserved here.
- In Thrikodithanam, a well-known and better preserved temple, issues centered around undocumented modern materials used in past restorations and their compatibility with original surfaces.

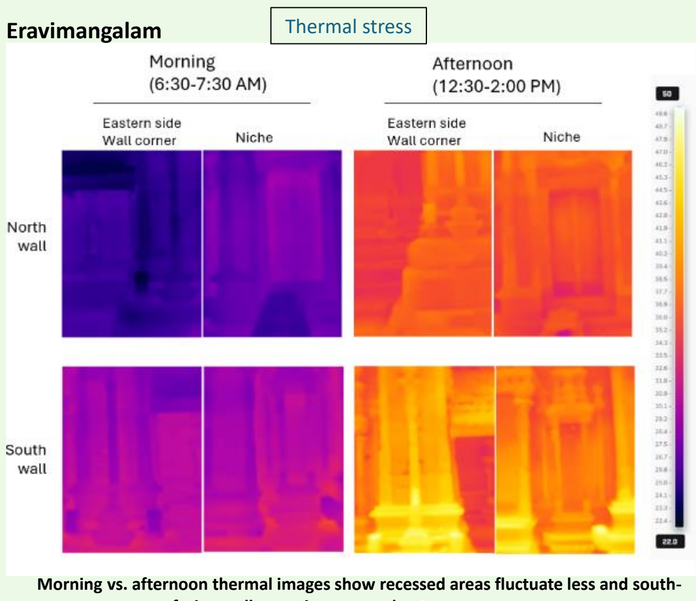
Eravimangalam



- Direct contact with rain (lack of roof cover)
- Likely rising damp (from dispersed or accumulated waters)

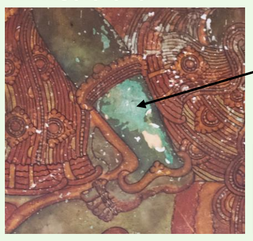
Shrine's south wall with extensive plaster loss along the lower level

Eravimangalam Thermal stress

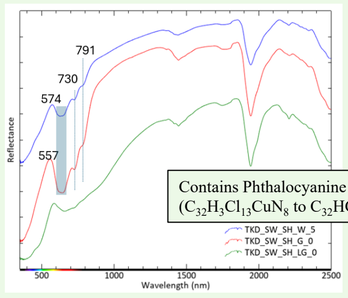


Morning vs. afternoon thermal images show recessed areas fluctuate less and south-facing walls remain warmer due to sun exposure.

Thrikodithanam



Material Compatibility issues



Bright blue-green color reintegration area (top) and FORS spectra of the spot showing absorptions similar to Phthalo green[5] (bottom)

Results - Implications

A correlation was found between temple status and preservation efforts within this sample set. Well-known temples have engaged stakeholders, while lesser-known sites face limited awareness and resistance, as conservation restrictions can threaten local ownership, often resulting in neglect.

- Generally well-preserved
- Well-known
- More resources
- Informed and open about Conservation

Thrikodithanam
Panayannarkavu
Pundareekapuram

Annakara

Eravimangalam

- Severe loss of murals
- Relatively Unknown
- Low resource investment in murals
- Recent Conservation Awareness; resistance from local community

Sustainable Solutions

Accessible documentation, combined with community engagement, fosters conservation understanding and acceptance. [6,7,8] As part of the study, a Kerala murals repository providing images, 3D models, and temple information was established.

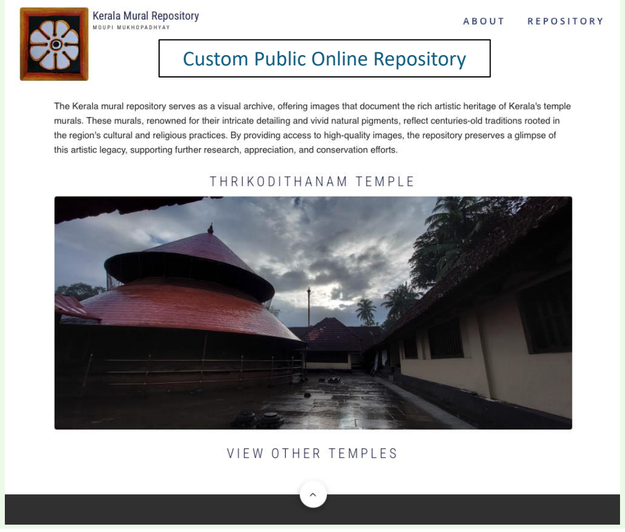
Public Outreach and Education: Murals and Conservation

- Promoting Conservation Acceptance

- Building resources for Conservation

Applying material findings for conservation

Combatting Dissociation[9]: **Need for Awareness and Accessibility**



Custom Public Online Repository

Conclusions

- Rapid, systematic documentation of Kerala's temple murals is essential to preserve knowledge even if murals are lost.
- Preservation outcomes are influenced by temple status: Well-known temples tend to have cooperative stakeholders; lesser-known sites may resist interventions when their sense of ownership is affected.
- A digital repository was created to provide accessible high-resolution images, temple details, and 3D models. Public outreach and stakeholder engagement are critical for raising awareness and fostering support.

References

1. A. Ramachandran, Painted Abode of Gods Apr. 2010, 1st ed. Vadehra Art Gallery, 2010.
2. A. Frenz and K. K. Marar, Wall Paintings in Kerala: 1000 Years of Temple Art. Arnoldsche, 2004.
3. L. M. Angheluță, A. I. Popovici, and L. C. Ratoiu, "A Web-Based Platform for 3D Visualization of Multimodal Imaging Data in Cultural Heritage Asset Documentation," Heritage, vol. 6, no. 12, pp. 7381–7399, 2023
4. B. Brunetti et al., "Non-invasive Investigations of Paintings by Portable Instrumentation: The MOLAB Experience," in Analytical Chemistry for Cultural Heritage, R. Mazzeo, Ed., Cham: Springer International Publishing, 2017, pp. 41–75.
5. Lawrence Berkeley National Laboratory Pigment Database.
6. S. Abdul Huq and B. Puthuvayi, "Assessing the Performance of Urban Heritage Conservation Projects – Influencing Factors, Aspects and Priority Weights," Built Herit., vol. 8, no. 1, p. 4, Mar. 2024
7. B. Mathisen, A. Paulus, G. Shaffrey, G. S. Rai, and R. Alatalu, "KC 1.2: Rights-Based Approaches in Rural Heritage-Principles and Practice.," in 2019 ICOMOS Advisory Committee Scientific Symposium, Marakkesh, Morokko, 2019.
8. D. Roy and S. N. Kalidindi, "Critical challenges in management of heritage conservation projects in India," J. Cult. Herit. Manag. Sustain. Dev., vol. 7, no. 3, pp. 290–307, Jan. 2017
9. Canadian Conservation Institute, "Dissociation." [Online].

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