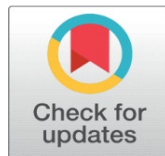
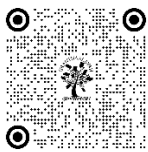


ANALYSING THE BRONZE CASTING DEVELOPMENT OF CONTEMPORARY AND TRADITIONAL SCULPTURE IN TAMILNADU

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DOI

[10.29121/shodhkosh.v5.i2.2024.1097](https://doi.org/10.29121/shodhkosh.v5.i2.2024.1097)

Funding: This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

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ABSTRACT

The art of sculpture in Tamil Nadu, India, pulsates with the rhythm of a vibrant history. For millennia, bronze casting has been a cornerstone of this artistic tradition, breathing life into deities, heroes, and narratives. However, contemporary expressions rise within this landscape, challenging and complementing the established forms. This article delves into this dynamic interplay, analysing the development of traditional and contemporary sculpture in Tamil Nadu, specifically focusing on the enduring and evolving art of bronze casting. The article aims to illuminate the state's rich tapestry of sculptural practices by examining case studies, exploring thematic concerns, and investigating socio-economic factors. Tamil Nadu boasts a vibrant tradition of sculpture, stretching back millennia and encompassing diverse materials, styles, and themes. This article delves into the fascinating dynamics between contemporary and traditional sculptural practices in the state. It examines how contemporary sculptors engage with, adapt, or challenge established forms, materials, and narratives, exploring the cross-pollination and tensions in this dynamic artistic landscape. The article analyses key trends and innovations within contemporary sculpture, highlighting the influence of globalisation, technological advancements, and social shifts. It also considers traditional sculptors' challenges in preserving their heritage while adapting to changing tastes and market forces. Through this comparative analysis, the article aims to shed light on the evolving nature of sculpture in Tamil Nadu and its potential future directions.

Keywords: Tamil Nadu Sculpture, Bronze Casting, Evolution of Sculpture, Socio-Economic Factors, Thematic Concerns, Contemporary, Traditional

1. INTRODUCTION

Bronze casting in Tamil Nadu is not merely a technique but a legacy. From the awe-inspiring Chola bronzes of the 9th-13th centuries to the intricate figures adorning contemporary art spaces, bronze sculptures resonate with cultural richness and artistic ingenuity. However, the artistic landscape of Tamil Nadu is dynamic. Contemporary sculptors push boundaries alongside traditional forms, employing diverse materials, themes, and approaches. The history of sculpture in Tamil Nadu is deeply intertwined with the state's cultural and religious heritage. From the majestic bronzes of Chola period temples to the intricate woodcarvings

adorning village shrines, traditional sculptures have served as potent expressions of faith, mythology, and social realities.

The development of bronze casting in Tamilnadu, India, encompasses contemporary and traditional techniques, reflecting a rich historical and cultural heritage. Research on the technology of melting, refining, and casting copper-based alloys, particularly bronzes containing tin, zinc, and lead, provides insights into creating bronze sculptures (Rzadkosz et al., 2014).

The investigations of casting cores from historical bronze sculptures offer valuable information about the provenance and casting techniques employed in traditional bronze casting (Lombardi, 2002). Additionally, studies on the evolution of bronze bell metal casting in the Korean Peninsula shed light on long-standing traditions of mould materials and alloys, contributing to a comprehensive understanding of traditional bronze casting practices (Won et al., 2022).

The analysis of modern cast bronze sculptures using optical emission spectroscopy and x-ray fluorescence spectroscopy provides valuable insights into the compositions of contemporary bronze sculptures, highlighting the continued relevance and evolution of bronze casting techniques in contemporary art (Young & Dunand, 2015).

The studies on the mechanical properties and microstructures of locally produced aluminium-bronze alloys through sand casting demonstrate the continued relevance of traditional casting methods in contemporary material engineering, emphasising the enduring significance of traditional casting techniques in modern industrial applications (Donatus et al., 2012).

In the context of Tamilnadu, the role of caste identity and cultural psychology is also pertinent. The emergence of caste-based associations as a significant factor in Tamilnadu underscores the cultural significance of caste identity, which may influence the development and preservation of traditional bronze-casting techniques within specific caste communities (Mahalingam, 2007).

The integration of a Tamil 'village' festival in the social fabric of Tamilnadu reflects the enduring influence of pre-colonial traditions, including the patronage of traditional art forms, such as bronze casting, within the local community (Neve, 2000).

Today, as India navigates the 21st century, Tamil Nadu's artistic landscape is witnessing a surge in contemporary sculptural practices. This article explores the multifaceted relationship between these two seemingly distinct branches of the art form. This article undertakes a journey through this dynamic field, examining the intricate relationship between the established and the emerging, with a specific lens on the continued relevance and evolution of bronze casting. The development of bronze casting in Tamilnadu encompasses a rich tapestry of traditional and contemporary techniques influenced by historical, cultural, and social factors. The synthesis of research on historical casting techniques, modern compositional studies of bronze sculptures, and the cultural context of Tamilnadu provides a comprehensive understanding of the multifaceted nature of bronze casting in the region.

2. TRADITIONAL SCULPTURE

The article overviews prominent traditional sculptural styles in Tamil Nadu, such as the Chola bronzes, Pallava rock-cut sculptures, and Dravidian temple architecture. It examines the unique characteristics of each style, including the use of materials, iconography, and technical expertise. It then discusses the challenges

faced by traditional sculptors, including competition from mass-produced religious icons, declining patronage, and the need for formal training opportunities. The article highlights efforts to preserve and revitalise traditional forms, such as government initiatives, craft workshops, and artist collectives. The traditional bronze sculptural styles in Tamil Nadu temples are deeply rooted in the region's rich cultural and artistic heritage.

Chola-period bronze cast Shiva Nataraja at the Rijksmuseum is a testament to the long-living tradition of metal casting in bronze established over a thousand years ago in Tamil Nadu, reflecting the enduring legacy of bronze sculptural art in the region (Slaczka et al., 2019).

Sculptures depicting the Rama-Ravana battle scenes can be found in the various temples of Tamil Nadu, showcasing the prevalence of traditional themes in temple sculptures. These sculptures are often based on the Ramayana, an ancient Indian epic (Jeyashree, 2022).

Contemporary temple murals in Tamil Nadu challenge the canonical framework of Indian art history, emphasising the significance of popular visual culture and questioning the dichotomy between high and low art, thereby highlighting the dynamic nature of temple art in the region (Sathish, 2014). Moreover, pilgrimage tourism studies have underscored the multifaceted role of religious institutions like temples in Tamil Nadu, emphasising their profound impact on religious, social, economic, and cultural life within the Tamil community (Aruljothi & Ramaswamy, 2012).

3. A TAPESTRY OF STYLES

Early Beginnings: The article begins with a historical overview, tracing the origins of bronze casting in Tamil Nadu from the Pallava period (3rd-9th centuries CE). Key stylistic features of early bronzes, like the slender proportions and simple drapery, will be discussed. Bronze casting in Tamil Nadu during the Pallava period was a significant aspect of the region's technological and cultural advancement.

The Pallava period in Tamil Nadu was characterised by urbanisation and the development of advanced metallurgical techniques, particularly in bronze casting (Vn, 2001).

The ethnic groups of Tamil Nadu, such as Chakkiliyar, Parayan, and Mutracha, have been identified as some of the most ancient groups dating back to the Palaeolithic period (Suhasini et al., 2011).

This historical context provides insight into the region's indigenous roots of bronze casting. Tamil Nadu has a rich history of powerful anti-caste political movements, which emerged long before Indian Independence (Niesz & Krishnamurthy, 2014).

The state's vigorous identity politics articulated by the Dravidian tamil movement has played a main significant role in shaping the social society and cultural landscape balance of Tamil Nadu. Additionally, the caste dynamics in Tamil Nadu have been a subject of genetic and anthropological studies, revealing the diversity and complexity of caste identities in the region (Pitchappan, 2002; Shankarkumar et al., 2003; Kanthimathi et al., 2007; Kanthimathi et al., 2008).

These studies shed light on the intricate social structures during the Pallava period and their potential influence on bronze-casting practices.

The political and institutional landscape of Tamil Nadu has been closely intertwined with caste dynamics, with non-Brahmin and Dravidian mobilisation

deeply entrenched in the state's history (Gorringe, 2011; Gross, 2022; Gorringe, 2017; Gorringe, 2016).

The emergence of modern cinema in Tamil Nadu and its role in nurturing and promoting a Dravidian identity and politics have been significant factors in shaping the socio-political environment of the region (Carswell & Neve, 2014; Damodaran & Gorringe, 2017).

This socio-political context likely had implications for the patronage and promotion of bronze casting during the Pallava period. The Pallava period in Tamil Nadu was also marked by the development of advanced agricultural and irrigation systems, which were influenced by ethnic and caste interactions (Waring, 2011).

The collective action and diversity within ethnic groups in traditional irrigation systems provide insights into the broader societal structures that may have influenced bronze casting practices. *Chola Grandeur*: The article delves into the golden age of bronze casting, the Chola period (9th-13th centuries CE). The iconic bronzes of this era, characterised by their dynamism, expressive details, and intricate jewellery, will be explored through case studies of Nataraja and Devi sculptures. The Chola period in Tamil Nadu witnessed political, economic, and cultural changes, significantly impacting bronze casting Heitzman (1987).

The chola-period bronze casting of Shiva Nataraja at the Rijksmuseum is a product of the long-living tradition of bronze metal casting established several thousand years ago in Tamil Nadu (Slaczka et al., 2019).

Genetic admixture studies have indicated the entry of various ethnic groups into Tamil Nadu during different periods, reflecting the diverse cultural milieu of the region (Suhasini et al., 2011).

This cultural diversity likely influenced the artistic and technological developments, including bronze casting, during the Chola period. The Chola period was characterised by the patronage of the arts, including the development of exquisite bronze sculptures, reflecting the cultural and technological advancements of the time. The tradition of bronze casting during this period was deeply rooted in the region's history and cultural practices, as evidenced by the enduring legacy of bronze sculptures such as the Shiva Nataraja. The genetic admixture studies further emphasise the multicultural influences that may have contributed to the artistic and technological landscape of the Chola period. The Chola period in Tamil Nadu was a time of significant artistic and cultural achievements, and the tradition of bronze casting played a pivotal role in shaping the region's artistic heritage. The diverse ethnic influences and the living tradition of metal casting established over a millennium ago underscore the rich and multifaceted nature of bronze casting during the Chola period.

Regional Variations: Moving beyond the Cholas, the article examines the stylistic diversity of bronze sculptures from other regions like Pandyan Nadu and Thanjavur. Regional variations in iconography, composition, and metalwork techniques will be highlighted.

Early Beginnings: The journey begins with the Pallava period (3rd-9th centuries CE), tracing the early roots of bronze casting in Tamil Nadu. Reference books like C. Sivaramamurti's "South Indian Bronzes" and S. Srinivasan's "The Use of Tin and Bronze in Prehistoric Southern Indian Metallurgy" shed light on the characteristic slender proportions and simple drapery of these early works.

Chola Grandeur: The article delves into the golden age of bronze casting, the Chola period (9th-13th centuries CE). Case studies of iconic sculptures like the Nataraja and Devi figures illuminate this era's dynamism, expressive details, and

intricate jewellery. R. Nagaswamy's "Facts of South Indian Art and Architecture" provides historical context and iconography insights. V. Udayakumar's "Traditional Wisdom and Current Practices of Bronze Technology in Tamil Nadu" offers technical details of Chola metalworking techniques. Beyond Cholas: Regional variations in style and iconography are explored beyond the Cholas. Douglas Barrett's "Indian Metal Sculpture" is a reference point for understanding the stylistic divergences across regions like Pandyan Nadu and Thanjavur. K.V. Raman and T.K. Saraswati delve deeper into specific regional variations, highlighting the distinctive features of their bronzes.

4. UNVEILING THE SYMBOLIC LANGUAGE

Iconographic Decoding: The article delves into the symbolic language embedded within the bronze sculptures. The significance of hand gestures (mudras), postures (asanas), and attributes will be explored, revealing the more profound meaning and narratives conveyed through these artistic expressions.

Divine Representations: C. Sivaramamurti's "Indian Bronze" describes how stylistic elements contribute to the divine aura of deity figures. Aparna Rao and Charlotte Schmid delve deeper into iconographic details like facial expressions and jewellery, uncovering their symbolic significance.

Mythological Narratives: The portrayal of scenes from mythology and epics like Ramayana and Mahabharata through bronze sculptures is explored. Susan Huntington's "Art of Ancient India" provides a broader context. At the same time, John Keay and Amita Ghosh analyse how composition, symbolism, and storytelling techniques convey these narratives. Beyond deities, the article examines how bronze sculptures depict scenes from mythology and epics like Ramayana and Mahabharata. The use of composition, symbolism, and storytelling techniques will be analysed.

5. THE ALCHEMY OF METAL MIXING

Demystifying the Process: The article delves into the intricacies of bronze metal mixing techniques employed in Tamil Nadu temple sculptures. The traditional methods of combining copper, tin, and other elements to achieve the desired properties will be explained.

Lost-wax Casting: The article explores the lost-wax casting technique, the hallmark of Tamil Nadu bronze sculptures. The intricate steps in mould-making, wax modelling, and metal pouring will be demystified.

Demystifying the Process: The intricacies of bronze metal mixing techniques employed in Tamil Nadu temple sculptures are unveiled. Drawing upon reference books like Ramesh Ghir's "Metal Technology in Tamil Nadu" and authors like K.T.M Hegde and S.R. Rao, the traditional methods of combining copper, tin, and other elements to achieve the desired properties are explained.

Lost-wax Casting: The article delves into the lost-wax casting technique, the hallmark of Tamil Nadu bronze sculptures. C. Sivaramamurti's "Cire Perdue Casting in India" offers a comprehensive overview, while research papers by authors like Udaya Prasad Sharma and M.V. Krishna provide detailed descriptions of the intricate steps involved in mould-making, wax modelling, and metal pouring.

The bronze metal mixing techniques employed in Tamil Nadu temple sculptures have a rich historical tradition dating back over a thousand years (Slaczka et al., 2019).

The Chola-period bronze Shiva Nataraja at the Rijksmuseum is a testament to the living tradition of metal casting in Tamil Nadu, showcasing the region's expertise in bronze sculpture (Slaczka et al., 2019).

The organisation of craft production in South India, particularly at temple sites, involved highly specialised techniques and shared knowledge among residential groups, emphasising the corporate nature of craft production in dealing with local rulers and temples (Sinopoli, 1988).

preliminary studies have identified old working and slag heaps in various parts of South India, including Tamil Nadu, indicating the historical presence of bronze-making and metal production in the region (Nayak, 2020).

The use of beeswax in the lost-wax technique of bronze melting is also noted, highlighting the utilisation of natural materials in the casting process (Bloch et al., 2010). Additionally, the fabrication of fibres using the electrospinning technique in Chennai, Tamil Nadu, demonstrates the region's material fabrication expertise, which could extend to metalworking techniques (Suneet et al., 2020).

The study of flow mechanisms in the Palar River Basin in Tamil Nadu using groundwater modelling techniques indicates the application of advanced scientific methods in understanding the region's hydrogeology, which could be relevant to the procurement of materials for bronze casting (Vetrimurugan et al., 2017).

The historical and cultural significance of temple sculptures in Tamil Nadu is evident, with extensive studies on fortification techniques and the architectural structure of temples, including the examination of Chola sculptures and ancient Tamil architectural techniques (Sivaramakarishnan, 2022; Raja, 2020).

contemporary temple murals in Tamil Nadu challenge the canonical framework of Indian art history, emphasising the importance of popular visual culture and its relevance to temple art (Sathish, 2014).

The need for methods enabling discourse on conservation practices in Tamil Nadu temple towns further underscores the significance of preserving the intangible heritage associated with temple sculptures (Prizeman et al., 2019).

Innovation and Adaptation: The article examines how metal mixing techniques evolved. Douglas Barrett's "Indian Metal Sculpture" and research papers by Sunil Gupta and U. Srinivasan discuss the introduction of new alloys and variations in proportions, highlighting the adaptability of these techniques. The introduction of new alloys and variations in proportions will be discussed, highlighting the adaptability of these techniques.

6. CONTEMPORARY SCULPTURE

The article presents a spectrum of contemporary sculptural practices in Tamil Nadu, showcasing the diversity of ideas, media, and techniques artists employ. It explores how contemporary sculptors respond to global trends, incorporating new materials like steel, fibreglass, and found objects. The article examines themes of social commentary, environmental concerns, and individual introspection reflected in contemporary works. It also discusses the rise of public art installations and the increasing visibility of women sculptors in the Tamil Nadu art scene.

Contemporary sculptural practices in Tamil Nadu have evolved within a dynamic cultural milieu, influenced by various societal and artistic factors. The expansion of sculptural practices in Tamil Nadu can be understood within the framework of the expanded field, as discussed (Torres, 2017). This framework

critically examines contemporary sculptural practices, acknowledging the diverse directions sculptural practice has taken in the post-medium era.

Evaluating the National Patient Safety Implementation Framework in healthcare facilities in Tamil Nadu highlights the importance of safety and quality standards in the context of artistic and sculptural practices (Krishnamoorthy et al., 2023).

This emphasis on safety and quality aligns with the need to adhere to best practices in contemporary sculptural work, ensuring the well-being of artists and the public. Additionally, the fasting practices prevalent in Tamil Nadu, as explored by (Kannan et al., 2016),

This shed light on the cultural and religious influences that shape daily life in the region. Deeply rooted in tradition, these practices contribute to the rich tapestry of cultural elements that inform contemporary artistic expressions, including sculptural practices. The synthesis of these references underscores the multidimensional nature of contemporary sculptural practices in Tamil Nadu, encompassing critical artistic frameworks, safety and quality standards, and cultural influences.

7. THE ENDURING LEGACY OF BRONZE CASTING

A Historical Panorama: The article embarks with a historical overview of bronze casting in Tamil Nadu, tracing its roots back to the ancient Indus Valley Civilization. Critical periods, from the Pallava rock-cut sculptures to the Chola bronzes, will be explored, highlighting the technical advancements, iconographic nuances, and stylistic shifts that shaped this art form.

Moreover, evaluating the National Patient Safety Implementation Framework in healthcare facilities in Tamil Nadu highlights the importance of safety and quality standards in the context of artistic and sculptural practices (Krishnamoorthy et al., 2023).

This emphasis on safety and quality aligns with the need to adhere to best practices in contemporary sculptural work, ensuring the well-being of artists and the public. Additionally, the fasting practices prevalent in Tamil Nadu, as explored by (Kannan et al., 2016),

The cultural and religious influences that shape daily life in the region. Deeply rooted in tradition, these practices contribute to the rich tapestry of cultural elements that inform contemporary artistic expressions, including sculptural practices. The synthesis of these references underscores the multidimensional nature of contemporary sculptural practices in Tamil Nadu, encompassing critical artistic frameworks, safety and quality standards, and cultural influences. These factors collectively contribute to the region's vibrant and evolving landscape of sculptural art. Mastering the Molten Fire: Demystifying and mastering the intricate process of bronze casting were highly developed techniques used; the article dives into the technical aspects of mould-making, wax modelling, metal preparation, and pouring. The article will showcase case studies of traditional foundries like Swamimalai, highlighting the skills passed down through generations and the challenges faced in preserving this heritage.

Beyond Deities and Kings: Examining the methodology of the thematic repertoire of traditional bronze sculptures was given the ideology of how they processed it and cast it to the temples; the article will move beyond the prevalent imagery of deities and rulers. It will explore diverse subjects like mythical figures,

animals, and everyday life, demonstrating the broader cultural canvas captured in bronze.

8. EMERGING EXPRESSIONS: THE CONTEMPORARY LANDSCAPE

Breaking the Mould: The article shifts focus to contemporary sculptural practices in Tamil Nadu, analysing how artists engage with, adapt, or challenge the established forms and materials. Case studies of prominent contemporary sculptors like S. Nandakumar and Vivian Sundaram will be explored, demonstrating how bronze is employed alongside diverse materials like steel, fibreglass, and found objects. Contemporary sculptural practices in Tamil Nadu are deeply rooted in the cultural and environmental context of the region.

The state's rich biodiversity and traditional knowledge of medicinal plants used in livestock treatment have influenced artistic expression. Parthiban et al. (2016).

The emergence of new species in the lichen flora Murugan et al. (2020) and the documentation of breed characteristics of indigenous sheep Karunanithi et al. (2005) reflect the close relationship between the people of Tamil Nadu and their natural surroundings, which likely influences their artistic practices.

The study of marine fish production in Tamil Nadu by Anuja et al. (2017) and identifying efficient cropping zones for major pulse crops by Sanbagavalli et al. (2020) indicate the significance of agriculture and marine resources in the region. This agricultural heritage and dependence on marine resources are likely reflected in the contemporary sculptural practices of the state.

The cultural and linguistic dynamics of Tamil Nadu, as evidenced by the vernacularization of the region Das (2008) and the influence of Tamil cinema on the society (Nakassis & Dean, 2007), play a crucial role in shaping the artistic expression, including sculptural practices.

The influence of cinematic culture and the need for prior knowledge of film canon in contemporary Tamil films Saverimuttu (2023) suggests a strong interplay between popular culture and artistic expressions in the state.

In addition, the state's vulnerability to natural hazards Balasundareshwaran et al. (2020) and the molecular epidemiology of diseases such as dengue Ramalingam et al. (2018) will likely impact contemporary sculptural practices' thematic and conceptual aspects. The need for effective disaster management and the prevalence of diseases may find expression in the art forms of the region.

Dialogues with Tradition: The article delves into the interplay between contemporary and traditional practices. How do contemporary artists draw inspiration from traditional forms, materials, and narratives? Are there instances of reinterpretations or critiques of established norms? The article will analyse specific works and exhibitions to understand this complex dialogue.

Thematic Explorations: Moving beyond technique, the article explores the thematic concerns addressed by contemporary sculptors. Issues like social commentary, environmental anxieties, and individual introspection will be discussed, examining how bronze and other materials convey these messages.

9. SHAPING THE FUTURE

Market Forces and Sustainability: The article acknowledges that traditional and contemporary Tamil Nadu sculptors face challenges. It examines the impact of

commercialisation, competition from mass-produced religious icons, and the changing art market. Solutions like artist collectives, government initiatives, and educational programs will be explored to ensure the sustainability of both practices.

Technology and Innovation: The article investigates the role of technology in shaping the future of sculpture in Tamil Nadu. From 3D printing and digital modelling to interactive installations, the impact of these advancements on traditional and contemporary practices will be analysed.

Reaching New Audiences: The article concludes by emphasising the importance of promoting accessibility and engagement with sculpture in Tamil Nadu. Public art initiatives, educational outreach programs, and digital platforms can be crucial in bringing traditional and contemporary expressions to wider audiences.

10. CONCLUSION

Exploring bronze casting development in Tamil Nadu reveals a rich tapestry of artistic heritage interwoven with contemporary expressions. Traditional sculptural practices, deeply rooted in the region's history and cultural ethos, continue to thrive alongside innovative approaches that respond to evolving societal, environmental, and artistic influences. The enduring legacy of bronze casting, traced back to ancient civilisations like the Pallavas and Cholas, showcases Tamil Nadu's sculptors' technical prowess and artistic sophistication through the ages. The intricate metal mixing techniques and lost-wax casting methods employed in traditional foundries like Swamimalai exemplify a heritage passed down through generations, preserving the artistry and craftsmanship of bronze sculpting.

Contemporary sculptors in Tamil Nadu navigate a dynamic landscape, drawing inspiration from traditional forms while embracing new materials, techniques, and thematic concerns. The emergence of public art installations, the increasing visibility of women sculptors, and the incorporation of global trends reflect the region's vibrant artistic evolution. Moreover, the interplay between contemporary and traditional practices sparks a dialogue that enriches both realms of sculptural expression. Artists engage with established forms, materials, and narratives, reinterpreting, critiquing, and innovating within a cultural context deeply influenced by social, environmental, and technological factors.

Looking ahead, the future of bronze casting in Tamil Nadu promises continued innovation, adaptation, and dialogue between tradition and modernity. As artists grapple with pressing societal issues and explore new avenues of expression, bronze sculpture remains a dynamic and enduring art form that reflects the spirit of Tamil Nadu's artistic heritage. The intricate bronze statue dance bridges between tradition and innovation that defines the art of sculpture in Tamil Nadu is far from over. As bronze continues to serve as a medium for both established and emerging expressions, the landscape evolves, reflecting the multifaceted identity of the state. The ongoing interplay between traditional and contemporary sculpture in Tamil Nadu creates a vibrant and dynamic artistic landscape. While challenges exist for both forms, their co-existence fosters innovation, dialogue, and a nuanced understanding of the state's artistic heritage. It concludes by reflecting on the potential future of sculpture in Tamil Nadu, emphasising the importance of fostering collaboration, innovation, and accessibility to ensure the art form's continued growth and relevance.

CONFLICT OF INTERESTS

None.

ACKNOWLEDGMENTS

None.

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