



Conservation Status & Strategies for Buddhist Gompha Mural Paintings in Western Himalayas

BY

Biyas Ghosh¹ and M. R. Singh^{2*}

National Research Laboratory for Conservation of Cultural Property, Mysore-570001

Ex Prof. Conservation, National Museum Institute, New Delhi-110011



Article History

Received: 11/10/2024

Accepted: 22/10/2024

Published: 25/10/2024

Vol – 2 Issue– 10

PP: - 15-22

Abstract

Indian mural paintings exhibit meticulous craftsmanship and reflect diverse regional styles. The history of mural painting in India, particularly within the context of Buddhist monasteries, spans centuries and reflects a rich tapestry of cultural, religious, and artistic evolution. This study delves into the socio-religious and artistic dynamics of mural paintings of Western Himalayas dating from the 10th century onwards, focusing on their conservation status and significance within the broader context of Buddhist art. Employing a multidisciplinary approach, including scientific analysis and art-historical methodologies, the research aims to document, assess, and preserve these invaluable cultural artifacts. Through empirical data research, field visits, and analysis of material evidence, the study seeks to deepen our understanding of the cultural heritage represented by mural paintings while contributing to the broader knowledge base on Buddhist art and its socio-cultural implications.

Keywords: Mural painting, Buddhist monasteries, Conservation, Cultural heritage, Art-historical analysis, Socio-religious significance

Background

Painting in ancient India, deeply intertwined with societal norms, expressed individual achievements and cultivated tastes. From prehistoric rock art to contemporary Indian art, a love for color and design remains intrinsic. Painting, the act of applying paint, pigment, color, or other mediums to a surface, has long served as a profound mode of creative expression spanning through time immemorial. In ancient India, painting was intricately intertwined with the social fabric of society. The Indian cultural ethos reverberates with a profound love for color and a keen sense of design, evident from the earliest prehistoric rock paintings to the vibrant spectrum of modern Indian contemporary art (Sivaramamurti, C., 1978). This enduring tradition of painting in India reflects a rich tapestry of artistic heritage, evolving and adapting across centuries while retaining its intrinsic essence.

In the case of prehistoric cave paintings, the walls of caves served as the primary support base. However, as human civilization evolved, the expansion of materials used for this purpose were noticed. Wood, walls, clay, leaves, and, more recently, materials such as copper, glass, and concrete have all been employed as support bases for painting. This wide spectrum of materials reflects the ingenuity and adaptability of human artistic expression across different cultures and epochs. Painting mediums play a crucial role in determining

the characteristics of different types of paint, including viscosity, miscibility, solubility, drying time, and more. These mediums are diverse and encompass oil, pastel, acrylic, watercolor, ink, hot wax, and even aerosol paints, as well as water-miscible oil paints. The pigment or base material suspended or embedded within these mediums undergoes natural degradation along with medium and substrate due to various physical factors. It is the task of conservationists to address and mitigate these processes, preserving the integrity and longevity of artistic works for future generations.

Mural Painting

Traditionally, mural paintings were executed on walls coated with plaster, which could be made of various materials such as clay, gypsum, or lime. The plaster provided a smooth and stable surface for the paint to adhere to. In modern times, artists use a variety of materials for mural painting, including cement, concrete, and specialized wall paints designed for outdoor or indoor use. Pigments used in mural painting are primarily minerals or synthetic compounds that provide color. These pigments are mixed with binders to create paint. Historically, natural pigments derived from minerals, plants, and animals were used (Natural Pigments Used in Ancient Times, <https://www.widewalls.ch/magazine/natural-pigments>). Common examples include ochre, charcoal, and various earth tones. In modern mural painting, synthetic



pigments offer a wider range of colors and often have better durability. Binders are substances that hold the pigment particles together and adhere them to the wall surface. Traditional binders included natural substances such as gum Arabic, animal glue, and lime. These binders provided adhesion and durability to the paint layer (Agarwal R.A, 1977). In modern mural painting, synthetic binders such as acrylics, latex, and epoxy resins are commonly used for their durability and versatility.

Ancient Indian mural paintings showcase a rich and ancient tradition of artistic excellence, characterized by meticulous craftsmanship and intricate detailing. These artworks, spanning from ancient times to the medieval period, exemplify a long lineage of artistic pursuit and cultural expression. The evolution of Indian mural painting techniques reveals a gradual progression from early experimentation to the refinement and perfection observed in later works. Dating back to as early as the 2nd century BC, the Ajanta caves stand as a testament to the sophistication and mastery achieved by Indian artists (Singh M. R. & Arbad BR, 2014). These cave paintings, along with those found in sites such as Sittanavalai (7th century AD) and Badami, Panamalai (8th century AD), reflect the diverse regional styles and artistic sensibilities prevalent during their respective periods (Jayapriya, S. 2023. Seastrand, A.L., 2022.). Furthermore, murals from temples like Kailashnatha (8th century AD) and Vrihadeshwara (Chola, 10th century AD) exhibit a fusion of religious symbolism and aesthetic beauty, showcasing the artistic vibrancy of ancient Indian civilizations. Even in later periods, such as the Mattancherri Palace murals, which flourished during the colonial era, Indian mural paintings continued to evolve, adapting to changing cultural influences while maintaining their distinctive artistic identity (Poyil, M., 2011).

The development of Indian mural painting techniques, as chronicled by scholars like Jayanta Chakrabarti, underscores the depth of artistic exploration and experimentation that preceded the creation of these masterpieces (Chakrabarti Jayanta, 1980). Vishnudharmottara Purana provides valuable insights into the materials and techniques used in ancient Indian mural painting (Sivaramamurti, C., 1978). The description highlights the multi-layered approach to mural creation, with specific compositions for each layer:

Arriccio (Underlying Layer):

The thickest layer, typically clay-based and mixed with chopped straw, vegetable fibers, or animal hair. Composition varied, including mixtures of earth, sand, powdered bricks or shells, and lime.

Intonaco (Superficial Layer):

Thinner and smoother than the arriccio, this layer received the paint. Composed of white clay (kaolin), gypsum, lime, or combinations of these materials.

Additionally, the use of various adhesives and binders is mentioned in the text, indicating the incorporation of substances like gums, resins, wax, liquorices, molasses, sugar, saps, vegetable broth, oils, and animal glue. These adhesives would have played a crucial role in binding the layers together

and ensuring the adherence of paint to the surface (Sharma, A. and Singh, M.R., 2020).

In addition to the Vishnudharmottara Purana, numerous other ancient texts offer detailed insights into the intricate technical aspects of Indian murals. Sanskrit treatises and Shilpa texts present abundant examples of wall paintings. The Ramayana of Valmiki mentions their existence, while Bharata's Natyasastra emphasizes the importance of wall paintings in auditoriums (Patel, D., 2019.). Puranic texts also contain varied and interesting information on wall painting. Among these texts, the Vishnudharmottara Purana, typically dated between the fourth and seventh centuries AD, stands out for its comprehensive coverage of painting in its chapter titled Chitrastotra (Nardi, I., 2003). The Chitrastotra is particularly noteworthy for its descriptions of various painting types, the preparation of walls and plaster, identification of painting defects, guidelines for scaling figures, characteristics of statues of deities, and depiction of different poses. These ancient texts collectively provide a wealth of knowledge about the artistry, techniques, and cultural significance of Indian mural painting, contributing to a deeper understanding and appreciation of this timeless form of artistic expression.

The Abhilashitartha Chintamani, believed to have been written in the twelfth century, presents an equally significant chapter dedicated to painting. This chapter provides detailed insights into the preparation of walls and media, the selection and mixing of colors, as well as techniques for gilding and burnishing. Following this, the Samarangana Sutradhara, authored by King Bhoja, primarily focused on architecture but also encompasses discussions on painting (Salvini, M., 2012). Additionally, the Silparatna from the sixteenth century includes a chapter specifically dedicated to the characteristics of painting, known as Chitra Lakshana. Other notable texts such as the Aparajita Praccha, Sarasvata Chitra Karmasastra, and Naradsilpa also touch upon painting, albeit with varying degrees of detail. These texts, containing valuable technical data and insights into the theory and practice of painting, have been subject to thorough study by scholars such as Siri Gunasinghe. Notably, the Samarangana Sutradhara has been published by Ananda K. Coomaraswamy along with a commentary elucidating the technique and theory of painting. Together, these texts constitute a rich repository of knowledge on the artistic traditions and techniques prevalent in ancient Indian painting.

Buddhism and Mural Paintings

Buddhism served as a catalyst for artistic endeavors across various mediums, including sculpture, painting, and architecture. This artistic legacy began with the renowned Ajanta and Bagh paintings and persisted beyond the Ajanta-Bagh era, evolving into awe-inspiring forms that blended artistic excellence with the inner devotion of the artists (Spink, W., 2017).

Following the Ajanta-Bagh era period (6th century AD), Buddhist painters, driven by their timeless devotion to Buddha, ventured into remote regions such as the Himalayas in Arunachal Pradesh, Ladakh region, Jammu & Kashmir, and

the Tabo Valley of Lahul & Spiti district in Himachal Pradesh to continue their work. These painters, as described by Nagpal in "Mural Paintings in India," sought solitude in these remote locations to further their artistic expressions and spiritual devotion (Nagpal J.C, 1988).

The spread of Buddhism across various parts of Asia gave rise to diverse art forms, a phenomenon well-documented in various texts, notably the Rajatarangini. Kalhana, in his chronicle, mentions the presence of Buddhist viharas as early as the 8th century (Bhat, R.M., 2022). According to historical accounts, Buddhism was introduced to the region by the Tibetan King Strong-tsan Po, who came to power in 629 AD. Subsequently, in the 10th century, a significant impetus for Buddhism came from Tibet under the reign of King Ye-Shes-'od. During his rule, he dispatched Rin-chen-bzang-Po (AD 958-1055) to India with the mission to bring back Buddhist scholars, artists, relics, literature, and artifacts. Rin-chen-bzang-Po's biography details his endeavors in building numerous Buddhist monasteries and temples in Western Tibet, Spiti, and Ladakh. Among these, the remains of the Nyarma Monastery still endure as a testament to his efforts and the flourishing of Buddhism in the region during that era (Skedzuhn, A. et al., 2018).

The Sadhanmala, dating back to AD 1104, is a valuable resource for understanding wall paintings, particularly in Ladakh. Comprising 312 Sadhanas, or spiritual exercises, dedicated to various male and female deities. This text offers insights into the iconography and symbolism depicted in these paintings. Authored by multiple individuals, including both named and anonymous contributors, the Sadhanmala provides a comprehensive guide to the rituals and practices associated with different deities. One notable aspect highlighted in the Sadhanmala is the significance of colors in representing different deities and their forms. The text acknowledges the diverse rites and functions associated with these deities, allowing for some flexibility in iconographic representation. This recognition of variability suggests that the criteria prescribed in the text are not rigidly followed in actual practice, offering artists some latitude for creative interpretation.

The Sadhanmala serves as a valuable reference for understanding the spiritual significance and artistic expression reflected in Ladakhi wall paintings, shedding light on the cultural and religious context in which they were created (Cavazos, N., 2016). Vajrayana Buddhism encompasses profound concepts such as bodhichitta, the continuous stream of consciousness, and mahasukha, supreme bliss. Interestingly, the concept of mahasukha, or supreme bliss, has had a significant influence on wall paintings within this tradition. Specifically, it has inspired the depiction of Yab-yum illustrations, symbolizing the union of male and female energies or the focused meditation on these energies. Moreover, Vajrayana Buddhism emphasizes the power of mantra, sacred hymns that hold immense spiritual significance. While mandalas are traditionally created on floors, sculpted on walls, and depicted in tangkas (scroll cloth paintings), they are also prominently featured in wall

paintings. Mandalas serve as visual representations of sacred realms or spiritual concepts, providing practitioners with a visual aid for meditation and contemplation. The incorporation of these profound concepts and symbolic representations into wall paintings reflects the rich spiritual tradition and artistic expression within Vajrayana Buddhism, offering practitioners a visual medium to deepen their understanding and experience of the divine (Wong, L., 2009). Mandala, often referred to as a mystic circle and a sphere of divinity, serves as a significant motif in mural paintings, as noted by Seth Mira in "Indian Painting; The Great Mural Tradition." In these paintings, a mandala typically features a Dhyani Buddha, representing a Buddha in meditation, positioned at the center. Surrounding the central figure are other Dhyani Buddhas arranged in a circle (Seth, M., 1987). Additionally, variations of mandalas may include sixteen Bodhisattvas and eight goddesses encircling the central Buddha figure.

Accompanying the spread of Buddhism was the establishment of a monastic culture, which significantly influenced the artistic landscape of the regions it reached. During the reign of Lalitaditya Muktapida (724 AD-760 AD), an emperor of the Kashmiri Karkota dynasty, art and trade flourished. Historical sources indicate that religious festivals were celebrated with fervor, and special facilities and encouragement were provided to support painters and sculptors. Lalitaditya, along with his minister Chakuna and son-in-law Jayapida, generously donated to Buddhist Viharas, contributing to the flourishing of monastic centers. Onk'ong (AD 751-759), a Chinese traveler to India, documented the presence of 300 monasteries in Kashmir alone. Monastic communities also thrived in North India, Bengal, Nepal, and Tibet, serving as rich centers of wealth and cultural exchange. These monasteries provided essential support to traders, offering resting places and facilitating trade routes. They were often led by influential Lamas who wielded significant influence over state policy and motivated royals to construct more monasteries.

Monks from these monastic centers played diverse roles, from leading diplomatic missions to defending territories when under attack. They even entered into marriages when royal heirs were required. In return for their services, monasteries received generous endowments of funds, gold, foodstuff, and statues from royal houses, as well as support from local communities. This wealth enabled them to patronize and promote various artistic endeavors, including the art of wall painting, which flourished under their patronage. Some of the important monasteries in the Indian Himalayan region are listed below in the table.

Name of the State	District	Name of the Monastery
-------------------	----------	-----------------------



Himachal Pradesh	Lahul&Spiti District	Tabo Monastery Lhalung Monastery Key Monastery Tangyud Monastery Dhankar Monastery
	Kinnaur District	Nako Monastery
	Kangra District	Tsuglagkhang Monastery
	Nako	Lakhang-Gongma Monastery
Leh & Ladakh	Leh&Ladakh	Alchi Monastery Lamayuru Monastery Basgo Monastery Mangyu Monastery Mulbek Monastery Sumda Chun Monastery Thikse Monastery

The location of monasteries in isolated, and high-altitude regions of the Himalayan ranges renders them highly inaccessible to the common public. Despite this remoteness, these monasteries house invaluable mural paintings that serve not only impeccable works of art but also as vivid manifestations of the diverse cultural heritage of the region. Each painting within these monasteries encapsulates a unique aspect of the cultural tapestry, making them rare treasures of living history.

Buddhist murals: documentation and conservation status

As previously mentioned, the Buddhist murals from the post-Ajanta Bagh era represent invaluable treasures of our socio-cultural history. However, many of these murals are currently facing the threat of deterioration due to their age (Agarwal O.P, 1995) The exact status of these murals in terms of museology and conservation is not well-documented. Nevertheless, it is evident that these paintings urgently require detailed scientific study and appropriate conservation measures. While the existence of these mural paintings is documented in various travelogues and research works, these texts often lack detailed information regarding the technicalities of the artworks and the necessary steps for their conservation (Ghosh, B.,et al., 2024). The deterioration of wall paintings is a complex phenomenon influenced by various factors (Tiwari, V.et al., 2022). Any degradation in the structure housing the paintings can ultimately affect the condition of the paintings themselves. Figure-1(a) depicts the

current state of 11th-century paintings at Lamayuru monastery, revealing a lime-marcula clay wall approximately 90cm thick exhibiting deep and wide cracks due to environmental factors and rainwater seepage from the thick marcula clay roof. Consequently, the painted plasters in various areas of the monastery have suffered losses. Image captured under a dinolite microscope, Figure-1(b) displays the roughness of the painted surface layer, characterized by an uneven spread of pigments and the presence of numerous foreign particles, including local clay and lime. To preserve the painted plasters, the initial crucial steps involve forensic investigation and retrofitting of the roof. A comprehensive scientific analysis of the clay matter and lime is imperative to formulate repair mortar that closely matches the original materials. Since organic additives such as rice husk, local plant seeds, and wheat husk have been incorporated for insulation and to mitigate crack formation, it is essential to synthesize a compatible plaster for repair purposes, ensuring chemical and morphological similarity to the original material of the monastery.

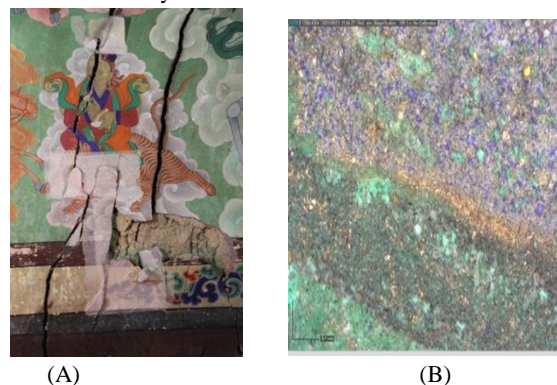


Fig. 1(a) Showing cracks and loss of painted plaster (b) Dinolite image of the painted surface Lamayuru monastery, Ladakh

Moreover, different types of plaster used in the creation of these murals undergo changes over time, further complicating the conservation efforts. Given the significance of these mural paintings as cultural artifacts, it is imperative to conduct comprehensive scientific studies to understand their condition and implement necessary conservation measures (Agrawal, O.P. and Pathak, R., 2001). Collaborative efforts involving experts in art conservation, museology, archaeology, and other related fields are essential to ensure the preservation of these invaluable pieces of history for future generations (Chung, Y.S.S., 2011).

First and foremost, it is essential to comprehensively study the materials used for the paintings and the techniques of execution employed by the artists. This includes analyzing the types of pigments, binders, and supports utilized in the creation of the murals, as well as the application methods and surface preparation techniques employed.

Once the materials and techniques are understood, the focus shifts to identifying the factors responsible for the deterioration of the mural paintings. This may include environmental factors such as exposure to humidity, temperature fluctuations, light exposure, and air pollutants, as

*Corresponding Author: M. R. Singh



well as physical factors like structural instability, water damage, and biological degradation caused by microorganisms (Lal B.B, 1966).

Based on the analysis of these factors, appropriate conservation treatments can be devised to mitigate deterioration and ensure the long-term preservation of the mural paintings. These treatments may include surface cleaning, consolidation of unstable pigments or substrates, structural stabilization, and environmental control to create a stable microclimate conducive to the preservation of the artworks (Mora, P. and Mora, L., 1984). Furthermore, ongoing monitoring and maintenance efforts are essential to assess the effectiveness of conservation treatments and address any emerging issues promptly. By adopting a comprehensive understanding of materials, techniques, deterioration factors, and conservation treatments, it becomes possible to develop sustainable strategies for the preservation of mural paintings and safeguard their cultural significance for future generations (Singh Tej and YadavAtul, 2000).

Objectives, scopes and novelty of the study

The study undertaken will yield multidimensional insights that will prove invaluable for the long-term preservation of the rich cultural heritage depicted in the form of mural paintings in the region. Additionally, this study will make a significant contribution to the existing knowledge base, enhancing our understanding of the socio-religious and cultural dynamics of the period under investigation. Outlined below are the key aspects of the study's scope, objectives, and innovations:

Scope:

Comprehensive analysis of materials, techniques, and deterioration factors affecting mural paintings.

Examination of environmental, physical, and biological factors impacting the condition of mural paintings.

Assessment of conservation treatments and strategies for prolonged preservation.

Objectives:

Identify and document the materials and techniques used in the creation of mural paintings.

Analyze the factors responsible for the deterioration of mural paintings.

Develop conservation treatments tailored to address specific deterioration issues.

Implement monitoring and maintenance protocols to ensure the effectiveness of conservation efforts.

Novelties:

Integration of scientific analysis with cultural and historical contexts to provide a holistic understanding of mural paintings.

Adoption of interdisciplinary approaches involving art conservation, archaeology, museology, and materials science.

Application of innovative conservation techniques to address complex deterioration challenges.

Contribution to the broader knowledge base on the socio-religious and cultural significance of mural paintings in the region.

By undertaking this comprehensive study, one can aim to not only preserve the tangible heritage of mural paintings but also deepen our appreciation and understanding of the intangible cultural heritage they represent.

Historic period and its importance

The period from 10th century onwards, a time when Tibetan Buddhism gained prominence and gradually evolved into its distinctive form. This period is of particular interest as it witnessed the transmission of Buddhism from India to Tibet. The art preserved in Himalayan monuments during this period holds immense significance for understanding the later Buddhist art in the Western Himalaya region and the development of esoteric religious forms in India.

The material evidence for these forms is often scarce and fragmentary in South Asia itself. Therefore, the art and artifacts preserved in the Himalayan monuments serve as invaluable resources for reconstructing and interpreting the cultural and religious history of this period. By studying these artifacts, we aim to gain deeper insights into the evolution of Buddhism, its influence on the broader region, and the development of Indian esoteric religious forms (Yamauchi, K et al.,2007)

The paintings from Western Himalaya hold immense value, akin to the renowned Ajanta and Bagh paintings. However, due to limited public exposure, the current conservation status of many of these paintings remains unknown. It is crucial to acknowledge that if these paintings deteriorate beyond a certain point, restoration efforts may become nearly impossible. The loss of such invaluable artworks would represent a significant setback for Indian art and cultural heritage. Research on the wall paintings in monasteries thus becomes imperative. These paintings serve as primary sources for reassessing and refining our understanding of the more public and popular aspects of Buddhism at specific times and places. By studying these paintings, we can gain insights into the religious, cultural, and artistic practices of the period, contributing to a deeper appreciation and preservation of this rich heritage.

ii). Probable contribution to knowledge pool from the metadata generated from the study undertaken:

A project that aims to go beyond scientific documentation of the conservation status of mural paintings is needed. The particular interest is in exploring the socio-religious and cultural nexus associated with each painting within the region. By undertaking a comprehensive study of these paintings, the conservation scientists may contribute significantly to the existing pool of knowledge and provide valuable insights for future researchers. Any research that delve into how the artists of that era were influenced by various socio-religious and cultural factors existing in the same time and space will be of

utmost importance. It is also necessary to investigate the influence of Buddhist philosophy-driven art forms on local artistic traditions. In Buddhist philosophy, the next incarnation of Buddha is called Maitreya, and it is interesting to study depictions of Bodhisattvas and the future Maitreya Buddha within the mural paintings.

The study should also focus on the artistic aspects of these paintings while considering technical aspects such as materials, techniques, and conservation status. By analyzing the forms of paintings of Bodhisattvas and Maitreya, one can generate new information about the evolution of mural forms over a specific era of time. This will provide a better understanding of the development of Buddhism and Buddhist art, shedding light on the cultural, religious, and artistic dynamics of the period under investigation. References: (<http://what-buddha-said.net/library.html>)

iii). Conservation aspects and scientific approaches of the study:

Indeed, there are numerous causes of damage and deterioration affecting wall paintings, each presenting unique challenges for conservation efforts. These paintings often comprise various types of pigments and binding media, which can degrade over time due to environmental factors such as humidity, temperature fluctuations, and exposure to light. In addition, varnishing of wall paintings was a common practice in the past, and as the varnish ages, its properties change, affecting the underlying painting. This deterioration can manifest in various forms, including discoloration, flaking, cracking, and loss of adhesion.

To address these challenges and preserve the inherent aesthetic value of wall paintings, it is imperative to undertake a meticulous documentation process. This involves carefully examining and recording the minutest details of the paintings, including their condition, materials used, and any visible signs of deterioration. By thoroughly documenting the wall paintings, conservation specialists can gain a comprehensive understanding of the deterioration problems affecting them. This, in turn, enables to devise appropriate remedial measures tailored to the specific conservation needs of each painting. Ultimately, through systematic documentation and careful examination, conservation efforts can be effectively directed towards preserving these invaluable cultural treasures while retaining their aesthetic integrity for future generations to appreciate.

Therefore, any research should aim to achieve the following objectives:

Study of Murals: Emphasizing their artistic importance, philosophical themes, and social impact within their cultural context.

Documentation: Determining the exact locations of the murals. Analyzing the nature of representations, color schemes, and themes depicted in the murals.

Assessment of Preservation Status: Documenting the present state of preservation, including the nature and condition of the

murals. Identifying issues of deterioration and problems related to conservation.

Cohort and Classification: Generating a cohort and classification system for Buddhist monastic mural paintings based on various criteria such as artistic styles, iconography, and historical context.

Catalogue Development: Creating a comprehensive catalogue for monastery paintings within a selected cohort, providing detailed information on each mural.

Case Studies: Conducting specific case studies to examine the extent of deterioration and practical application of remedial measures on selected murals.

Conservation Techniques: Suggesting suitable conservation techniques for the proper restoration and prolonged persistence of the murals, based on the findings from the case studies and broader research.

By accomplishing these objectives, the research should aim to contribute significantly to the understanding, documentation, and preservation of Buddhist monastic mural paintings, ensuring their cultural and artistic legacy endures for future generations.

Methodology

The research methodology should combine scientific and art-historical methods to evaluate existing material evidence. This approach is motivated by the need to enhance awareness regarding the methodology used in art historical research and to emphasize the significance of visual culture in comprehending religious, social, and cultural developments within Buddhism and its broader contexts. This type of research involves a multidisciplinary approach, combining scientific techniques with traditional art-historical methods. This likely includes techniques such as material analysis, pigment identification, imaging technologies, and conservation science, along with art-historical methodologies like stylistic analysis, iconographic studies, and historical contextualization.

The research should also take into account new documentation and recent scholarly research on the history and development of Buddhism. This will ensure that the evaluation is informed by the latest findings and interpretations in the field. One of the primary objectives is to assess the conservation status of Monasteries' wall paintings. This likely involves determining their current condition, identifying any deterioration or damage, and proposing conservation strategies to preserve these artworks for future generations.

The research must recognize the value of visual culture as a means to understand religious, social, and cultural developments within Buddhism and beyond. This suggests a broader perspective that goes beyond mere aesthetic appreciation, focusing on how visual artifacts reflect and contribute to broader historical and cultural narratives. The research aim should be targeted to raise awareness about the methodologies used in art historical research, particularly

concerning the conservation and interpretation of Monasteries' wall paintings. This may involve addressing methodological challenges, discussing best practices, and highlighting the importance of interdisciplinary approaches.

The methodology should underscore the interdisciplinary nature of art historical research and its significance in understanding the complexities of religious, social, and cultural developments within the context of Buddhism and its wider socio-historical milieu.

Data Collection

The study should utilize a combination of empirical data research, literature survey, and collection of data from secondary sources including, gathering primary data through field visits and documentation of mural paintings. Given the expansive spread of Buddhist gomphas in the Western Himalayan region, one may acknowledge the impracticality of covering all of them within the scope of study. Instead, focus on a specific cohort that has been selected based on socio-religious importance and other historical values should be opted.

The key points of study cohort are:

The cohort selected may be based on specific criteria, likely including socio-religious importance and historical significance. These criteria are important for ensuring that the selected gomphas are representative of broader trends or are particularly significant within the context of the study.

Recognizing the limitations of resources and time, a strategic decision may be made to focus on a specific cohort rather than attempting to cover all gomphas in the region. This focused approach allows for a more in-depth and detailed study of the selected sites.

The cohort selected for the study should be characterized by a lack of detailed information regarding the conservation status of the mural paintings. This underscores the importance of conducting a comprehensive and detailed study to fill this gap in the existing literature.

The selected cohort is deemed to hold significant socio-religious and historical values, which further justifies the decision to prioritize their study. This implies that the findings from this study are likely to contribute significantly to our understanding of the cultural and religious heritage of the Western Himalayan region.

This approach involves a balance between practical considerations (such as resource constraints) and the need for thorough research to address gaps in knowledge regarding the conservation status of mural paintings in the selected cohort of Buddhist gomphas. This focused approach allows for a more detailed investigation, ultimately enhancing our understanding of the cultural and religious landscape of the region.

Focused Area/Selected Cohort

Alchi group of Monuments (Monastery)

1. Alchi (late 12th to early 13th century)

2. Sudma Chun (11th Century)
3. Mangyu (late 12th to early 13th century)
4. Wanla (12th Century)
5. Basgo (15th Century)
6. Saspol (13th - 15th Century)
7. Lakhang-Gongma Monastery- Nako (12th Century)
8. Phugtal Monastery (13th-14th Century) –Zanskar valley

Pigment Analysis

The analytical instrumental techniques that can be used to examine the paint layer stratigraphy, plaster layers, the priming layers and inorganic pigments composition include:

1. Polarized light Microscopy (PLM)
2. Microscopic examination on cross section.
3. X-ray fluorescence (XRF)
4. X-ray diffraction (XRD)
5. Micro-Raman Spectroscopy (μ -Rs)
6. Fourier Transform infrared spectroscopy (FTIR)
7. Scanning electron microscopy with an energy dispersive spectrometer (SEM-EDX)

The scope of study should be targeted in answering queries like:

- Defining the degree of restoration which should be considered as 'enough'?
- To assess the efficiency and endurance of chosen methods of study in defying the natural causes behind decay.
- Should the varnish on wall paintings tending to discolour be removed to reveal the original work or be left alone as part of the artist's work?
- Should the nature of pigments vary from region to region?

Conclusion

Ancient Indian mural paintings epitomize artistic excellence and cultural expression. From Ajanta to Mattancheri Palace, they showcase a journey of refinement and mastery. Texts like the Vishnudharmottara Purana offer technical insights into materials and techniques. These texts, alongside the Ramayana and Natyasastra, underscore the cultural significance of mural painting. With meticulous detailing and craftsmanship, Indian mural paintings stand as enduring symbols of artistic ingenuity throughout history. The study underscores the importance of preserving and understanding mural paintings as crucial components of India's cultural and religious heritage, particularly within the context of Buddhist monastic art. By adopting a comprehensive approach that integrates scientific analysis with art-historical methods, the research shed light on the conservation challenges faced by these invaluable artworks. The findings emphasize the need for collaborative efforts involving experts in art conservation, archaeology, and museology to develop sustainable strategies for the preservation of mural paintings. Through meticulous documentation and analysis, this study has provided valuable insights into the socio-religious significance, artistic techniques, and conservation status of mural paintings,

ensuring their continued existence as treasures of our shared cultural legacy for future generations to appreciate and learn from.

References

1. Agarwal O.P (Editor), 1995, *Conservation of Wall Paintings- Achievements and Problems*, INTACH Indian Conservation Institute, Lucknow.
2. Agarwal R.A, 1977, *Marwar Murals*, AgamPrakashan, Delhi.
3. Agrawal, O.P. and Pathak, R., 2001. Examination and conservation of wall paintings: a manual. (*No Title*).
4. Bhat, R.M., 2022. Legacy of Buddhism in Kashmir. *Journal of Psychology and Political Science (JPPS) ISSN*, pp.2799-1024.
5. Cavazos, N., 2016. *The art of devotion: Style, culture, and practice in mid-nineteenth-century Kashmir*. Utah State University.
6. Chakrabarti Jayanta, 1980, *Technique in Indian Mural Painting*, K.P Bagchi & Company, Calcutta.
7. Chung, Y.S.S., 2011. Conservation of Ancient Sites on the Silk Road: Proceedings of the Second International Conference on the Conservation of Grotto Sites, Mogao Grottoes, Dunhuang, People's Republic of China, June 28-July 3, 2004. *Collections*, 7(1), pp.55-59.
8. Ghosh, B., Singh, R. and Sawant, M., 2024. Digital Technology: A Step to Protect Cave Art of Indian Subcontinent as National Heritage—A Review. *Preservation, Digital Technology & Culture*, 53(1), pp.15-28.
9. Jayapriya, S., Anisha, C. and Jaisri, J., 2023. Indian Traditional Paintings A Journey through time
10. Lal B.B, 1966, *Conservation of Wall Paintings in India*, Indian Association for the Study of Conservation of Cultural Property, New Delhi.
11. Mora, P. and Mora, L., 1984. Conservation of Wall Painting. 494 pp.
12. Nagpall J.C, *Mural Paintings In India; 1988, A Historical Technical and Archaeological Perspective*, Gian Publishing House, Delhi,
13. Nardi, I., 2003. *The theory of Indian painting: The citrasutras, their uses and interpretations*. University of London, School of Oriental and African Studies (United Kingdom).
14. Patel, D., 2019. *The changing dynamics of a traditional art form case study of on Bharatanatyam Margam* (Doctoral dissertation, Maharaja Sayajirao University of Baroda (India)).
15. Poyil, M., 2011, January. THODIKALAM MURAL PAINTINGS: FEATURES, MEANINGS AND TECHNIQUES. In *Proceedings of the Indian History Congress* (Vol. 72, pp. 1239-1246). Indian History Congress.
16. Salvini, M., 2012. The Samarānganasūtradhāra: Themes and Context for the Science of Vāstu. *Journal of the Royal Asiatic Society*, 22(1), pp.35-55
17. Seastrand, A.L., 2022. Methods for murals: Temple painting in southeastern India. In *The Routledge Handbook of Hindu Temples* (pp. 175-196). Routledge India.
18. Seth Mira, *Indian Painting; The Great Mural Tradition*, Mapin Publishing Pvt. Ltd., New York, 2006
19. Seth, M., 1987. *Dogra wall paintings in Jammu and Kashmir. (No Title)*.
20. Sharma, A. and Singh, M.R., 2020. Multi-analytical investigation of the composition and binders used in the earthen support layer of fifth–fourteenth century CE painted fragments from Bezeklik, China. *Studies in Conservation*, 65(4), pp.221-237.
21. Singh M. R. and Arbad, B.R., 2014. ANCIENT INDIAN PAINTING RECIPES AND MURAL ART TECHNIQUE AT AJANTA. *International Journal of Conservation Science*, 5(1).
22. Singh Tej and YadavAtul, 2000, *Manual for Wall Painting Conservators*, NRLC, Lucknow.
23. Sivaramamurti, C., 1978. *Chitrasūtra of the Vishnudharmottara. (No Title)*.
24. Sivaramamurti, C., 1978. *The painter in ancient India*. Abhinav Publications.
25. Skedzuhn, A., Oeter, M., Bläuer, C. and Luczanits, C., 2018. The secrets of 14th century wall painting in the Western Himalayas: Structural damage sheds light onto the painting technique in the Tsuglagkhang in Kanji in Ladakh.
26. Spink, W., 2017. *Ajanta: History and Development, Volume 7 Bagh, Dandin, Cells and Cell Doorways* (Vol. 18). Brill..
27. Tiwari, V., Singh, R. and Pandey, A.K., 2022. REVIEW OF LIGNOLYTIC FUNGI INVADING WOOD, AND LEATHER AND CONTROL OF SELECTED FUNGI BY USING VOLATILE ESSENTIAL OIL OF PLANT ORIGIN. *Biochemical & Cellular Archives*, 22(2).
28. Wong, L., 2009. *Mural Painting of the Silk Road: Cultural Exchanges between East and West*.
29. Yadav A.K, *A Study of Natural Pigments in Indian Paintings*, NRLC, Lucknow, 1981.
30. Yamauchi, K., Taniguchi, Y. and Uno, T. eds., 2007. *Mural Paintings of the Silk Road: Cultural Exchanges Between East and West: Proceedings of the 29th Annual International Symposium on the Conservation and Restoration of Cultural Property, National Research Institute for Cultural Properties, Tokyo, January 2006*. Archetype Publications.