Adaption of Neo-Vernacular Architecture in the Contemporary Temples in India: Insights from Selected Case Studies

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Abstract

India has a rich cultural diversity, and often faces challenges in the preservation of these cultural traits manifested in traditional architectural values. In fact, it has undergone tremendous changes in its buildings over the years due to modernization which has impacted its architectural landscape. In this context, there is a need for a dynamic response to balance the traditions with innovations and modernity. The call for an architectural style that would minimize environmental impact while honoring local traditions require the development of new concepts. Such concepts also need to meet structural stability requirements and incorporate technological interventions. In fact, these give rise to a style often known as Neo-Vernacular architecture. This paper explores the integration of Neo-Vernacular elements and their role in the traditional Indian temples and how they affect the multifaceted functions.

The research employs a qualitative descriptive method. It focuses on case studies of three temples from different regions to explore the characteristics and principles of Neo-Vernacular architecture. Data was collected through site visits to these three Temples: Lotus Temple in New Delhi, the Temple of Shiva in Barmer, Rajasthan and Nandyal Balaji Temple in Andhra Pradesh. It also derives data from literature to support these findings.

It concludes that the adaption of Neo Vernacular architecture in modern Indian temples marks a crucial juncture where tradition intersects with innovation to transform the built environment. It is argued that this architectural style is significant in preserving cultural heritage while meeting the changing needs of the society.

Keywords: Neo-Vernacular, Contemporary architecture, Traditional Architecture, Indian Temples.

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Introduction

India is a country rich with cultural diversity and architectural heritage and has experienced a profound transformation of its built environment over the centuries. From the stunning Mughal palaces to the complex temple architecture of ancient civilizations, the architectural heritage of India is a testament to its historical and cultural depth. However, modernization and globalization have caused significant changes in the architectural landscape and often challenge the preservation of traditional architectural values. In this context, there is a need to create a flexible approach that harmonizes tradition with innovation, and sustainability with modernity.

Architecture has always reflected needs, morals, and aspirations of communities. In India, known for rich cultural diversity and heritage, architectural landscapes have witnessed collaboration between tradition and modernity. Among movements influencing India's built environment, vernacular architecture proves innovative adaptation of design principles to local climates, materials, and contexts. In this connection, Zographaki (1986) says that as an emerging paradigm, Neo-Vernacular architecture represents a forward-looking approach inspired by the old traditions incorporating contemporary innovations. He further adds that due to rapid urbanization, climate change and the need for sustainable development, exploring Neo-vernacular architecture could be employed to shape the built environment better.

Prof. P. Bhaskar Reddy of Sri Venkateshwara University, Tirupati confirms that in India's early civilization, temples had become the most important architectural forms, encompassing the essence of social structure. He adds that Indian temples functioned as hubs for cultural, financial and educational activities, and have been an overwhelmingly influencing factor for social endeavors. Reddy (n.d) advocates that the Indian temples historically represented ultimate human wisdom as spiritual sanctuaries and architectural marvels. This tradition continues with necessary adaptations. In fact, these architectural marvels are inspiring and creating sensations even today and offer timeless examples related to environmental management, architectural precision and socio-cultural ethics. Indeed, these temples advocate healthy practices across fields as social emulation models. Their long-lasting importance highlights their role as a guiding light of enlightenment, helping people move towards peace and progress.

Interestingly, today, visionary architects blend traditional religious beliefs with sustainable architecture by respecting local contexts. These modern temples represent the continuing trend, paving the way for the society. As people appreciate such projects, societal paradigms embrace heritage, sustainability and contemporary aesthetics.

In this context, this paper explores the aptness of adapting a neo-vernacular style in modern Indian temples and its impact on the conservation of heritage and livable future. It's aim is to provide an overview of the neo-vernacular architecture in India by examining contemporary temples from different parts of India. Its objectives are as follows:

a) To identify the elements of neo-vernacular architecture.
b) To identify the role of Indian temples in the community.
c) To investigate how modern architects incorporate neo-vernacular approaches and respect the rich cultural and religious significance of temples.
d) To ascertain the effects of adopting neo-vernacular approaches in the temples.

Theoretical Framework

Rapoport (1969) defines vernacular as practices based on the people, nurtured over long periods of community existence. Indeed, vernacular therefore forms the bedrock of a community. He warns that the prospective risks of abandoning the cultural and traditional practices could be enormous. Hasibuan (2022) elaborates that vernacular architecture includes a wide range of traditional construction practices that have evolved over the centuries to adapt to local climate, materials and lifestyles. Oliver (2007) adds and points out that India's vernacular architecture is deeply rooted in its diverse culture and history. He argues that without the understanding of its history, culture could lose its grounding. Indian vocabularies are characterized by the use of indigenous materials, craftsmanship and sustainable ideologies.

Turkusic (2011) explains that vernacular architecture, including individual buildings, groups of buildings, and settlements, is often called 'architecture without architects.' It follows local traditions and evolves based on the climate, lifestyle, and materials available in each area. It focuses on practicality and sustainability, using local materials in purposeful designs. Zografaki (1986) defines that in the mid-19th century, people tried to make the subjective romantic experience more systematic and scientific and in later 20th century, those older styles are reused in "neo" forms, and new styles are sought, leading to post-modernism or neo-vernacular architecture. He adds that neo-vernacular buildings have a unique identity and incorporate historic elements into modern designs.

However, the neo-vernacular doesn't need to be "authentic" or create a replica of the past to celebrate history, but it creates a new version of the past. He adds that Neo-vernacular buildings have a unique identity and treat historic content as livable and adaptable. Unlike accurate restorations, they don't need to be 'genuine' to evoke the past. In this approach, the focus shifts from the object itself to the message it conveys. By altering history, they create an imagined version that suits our desires and provides desired experiences. This imaginative quality is the strongest aspect of neo-vernacular buildings.

Rajpu (2020) says that in contrast to vernacular architecture, neo-vernacular architecture is an intentional and informed effort of trained architects, rather than an organic result of the community tradition. It is based on specific elements of traditional vernacular designs that seamlessly adapt to modern needs with technical precision. Hasibuan (2022) explains that this approach involves reproducing distinct vernacular forms within contemporary structures using modern technologies to create a fusion of the past and the present. While maintaining its unique identity, neo-vernacular architecture considers historical elements adaptable and livable, allowing changes to adapt to the desired experiences. Traditional components are integrated as details and conceptual outline within a contemporary framework, sometimes abstractly or symbolically.

The historical roots of neo-vernacular architecture in India can be traced back to the arts and crafts movement of the late 19th century, which sought to revive the traditional crafts amidst industrialization. Architects such as Hassan Fathy, Geoffrey Bawa, Laurie Baker and Charles Correa have played a key role in advocating the return of the principles in the modern era. Their emphasis on local materials, passive design strategies, and a comprehensive understanding of indigenous cultures have laid the foundations for neo-vernacular architecture in India; probably this shift has been driven by an increase in the awareness of environmental issues and the desire to reconnect with the cultural roots.

Jagatramka, (2021) points out that vernacular architecture experiences various transformations which might be different for rural and urban areas They are influenced by different factors like climatic conditions, change of material use and technology, as well as changes due to policies, markets and social structures. These transformations result in a disconnect between the past and the present which can affect the built environment either in a positive or a negative way. Though these changes cannot be avoided, steps can be taken to control these and hence, neo vernacular architecture can bridge the gap to fulfill this purpose.

Throughout the architectural history of India, from the ancient civilization of the Indus Valley to the Mughal era, each period has left a distinctive impression on the architectural environment. The colonial period introduced Western architectural styles, which resulted in the fusion of the traditional and the European elements, while post-independence witnessed an explosion of modernist architecture characterized by functionalism and industrial materials.

Rudyanto Soesilo mentions that since the rise of postmodernism in the 1970's, the vernacular, traditional and local cultures have been given a chance to revive and neo vernacular style became one of the types of postmodern architecture. In this regard, Rajpu (2020) advocates that neo-vernacular architecture has emerged as a response to modernization, while honoring India's rich architectural heritage and combining traditional wisdom with contemporary design principles.

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An Introduction to Indian Temples

Temples in India have been the dynamic centers of religious and social life in villages and towns and have played a decisive role in community affairs in the past. Indeed, they carry the same importance in the 21st century too. In addition to their religious functions, they are important social institutions and are intricately embedded in the society (Mukerji & Basu, 2015).

Singh (2020) highlights the importance of religious buildings in India's architectural history and emphasizes the fact that temples have been the most eternal, meaningful and prestigious structures in the Indian subcontinent. Bhaskar Reddy of Sri Venkateshwara University adds that temples have historically served as a focal point for social, cultural and educational activities and are actively involved in community life. They have maintained close links with territorial and community bodies and have made considerable contributions to local governance and administration.

Indeed, the Indian temples are landmarks, serving as permanent symbols of cultural identity and spiritual significance. They also serve as gathering places for religious observations, cultural events and social interactions of communities. In addition, a temple is a repository of knowledge and provides resources for spiritual learning and educational activities. A temple represents the values, beliefs and aspirations of its respective communities as a reflection of society. They are also inspirations and models for society, promoting moral values, social cohesion and common well-being.

Undeniably, temples are multi-faceted institutions, transcending their religious roles and acting as a pillar of community life, contributing to social, cultural and educational development of the society.

Temples as Landmarks

As observed from the history of Indian architecture, the Hindu temples have been iconic landmarks in society because of their cultural, religious and architectural significance. These temples serve as worship centers, community gatherings and cultural heritage, and have a unique place in the hearts of millions of people. Their high spires, elaborate sculptures and vibrant ceremonies make them instantly recognizable as symbols of the spiritual and architectural heritage of India.

The temples also attract tourists from all over the world to appreciate their beauty and historical & cultural significance. They are the landmarks that not only guide the devotees on spiritual journeys, but also confirms India's rich cultural heritage and enduring traditions (Salman, 2019). The examples of landmark temples can be seen in Figure 1 & Figure 2.

Fig. 1: Bird's Eye view of The Jagannath Temple at Puri, Odisha-As landmark at urban scale, Source: Image courtesy- Sangram Keshari Senapat , Retrieved from
https://upload.wikimedia.org/wikipedia/commons/9/90/Bird_view_of_Jagannath_Temple%2C_Puri.jpg

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Fig. 2: A view of the Ranganathaswamy Temple, Srirangam in   Tamil Nadu,
Source: Image courtesy-I.Mahesh, Retrieved from
https://en.wikipedia.org/wiki/File:Aerial_view_of_Sri_Rangam_temple_near_Tiruchirapalli_1.jpg

Temples as Places of Assembly

Reddy (n.d) explains that temples play an important role in Indian society, beyond religion. As a worship center, temples unite believers through rituals and ceremonies to promote spiritual unity and also hosts cultural events presenting art, music and dance, enabling cultural expression and community integration. In addition, temples provide places for meetings, discussions and gatherings that allow dialogue, collaboration and collective decision-making (Figure 3, Figure 4).

According to the typical plan of Indian temples, mandapas (one or more) have always been an essential part of temple layout/plan and used for public assembly and performing various rituals (Figure 5). Overall, the temples are dynamic centers of interactions between religion, culture, and society and contribute to community cohesion.

Fig. 3: Public gathering at Iskcon Temple, Bangalore
Source: Retrieved from- https://www.iskconbangalore.org/harinam-diksha/.

Fig. 4: Devotees performing rituals at Golden temple, Amritsar, India,
Source: Retrieved from https://files.prokerala.com/news/photos/imgs/1024/sikh-devotees-offer-prayer-at-golden-temple-on-1380817.jpg
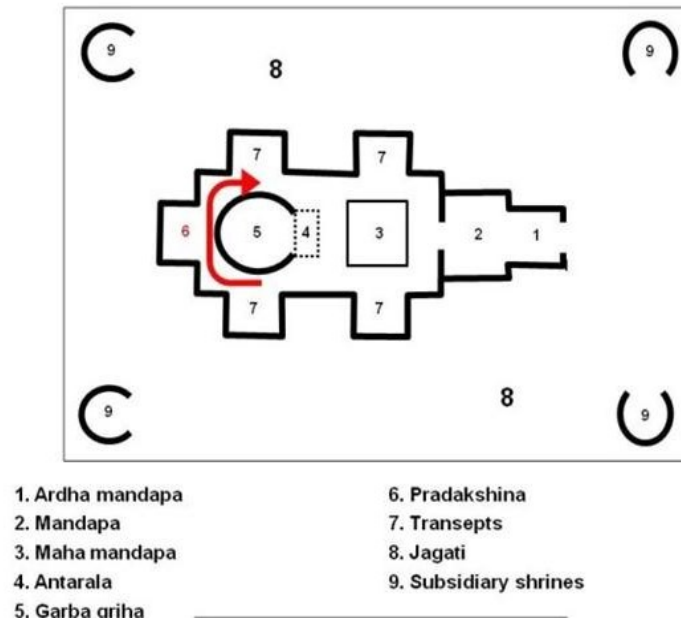
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Fig. 5: Plan of Kandariya Mahadeva Temple, Khajuraho
Source: Author-Tangopaso,Retrieved from
https://upload.wikimedia.org/wikipedia/commons/0/02/Plan_of_Kandariya_Mahadeva_temple.jpg

Temples as Educational Institution & knowledge Resource Centers

Reddy also says that Indian temples have served as centers of worship, education and cultural conservation for centuries. The temples housed libraries, manuscripts and schools, and have been the center of philosophy, theology, astronomy, medicine and art since ancient times.

The Gurukul system was often created in the temple area, where scriptures and texts were stored for generations. Monks and scholars play a key role in the reproduction, preservation and interpretation of sacred works. In addition to formal education, the temple nurtured traditional arts, music, dance and literature through cultural performances that promoted talents and artistic heritage. In short, the temples have long been knowledge centers that promote research, preserve culture and facilitate lifelong learning in Indian society.

Temples as Reflections of Society

The study of India's glorious temple history reveals that these temples vividly reflect society through architecture, social functions and religious practices. Their intricate craftsmanship illustrates the diverse styles, regional identities and stories of historical eras. Temple designs show the social evolution of the southern Dravidian style to the northern Nagara style in India. The temple has historically been a center of worship, festivals and activities. Social norms and customs were maintained by rituals, ceremonies and religious practices. Religious pluralism is evident through the different divinities representing the spiritual landscape of India. Mythological representations offer insights into social ethos, morality, and heritage.

Temple construction has used local materials and sculptures representing the local crafts, beliefs and trends (Figure 6 & Figure 7). Water conservation methods are examples of wisdom in limited resource regions (Figure 8). In essence, Indian temples are a living embodiment of social ethics, consciousness and heritage. Its symbolism, significance, and function are deeply influenced by Indian society and perpetuate traditions, values, and identity across generations.

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Fig. 6: Sculptures on the Gopuram of Meenakshi Amman Temple, Madurai showcasing religious convictions (From top to bottom) A- Kali goddess (known as destroyer of evil forces, embodiment of female power, and goddess of time and death) in her cosmic form, B- Sadashiva, - The highest form of Shiva, C- Guardian deities and Indra (The sky god) on his elephant, D- Shiva as Virabhadra- his 'fierce' avatar,
Source: Image courtesy-Rama toshi, Retrieved from https://ramaarya.blog/wp-content/uploads/2020/05/madurai-temple-gopura-3.jpg & https://ramaarya.blog/wp-content/uploads/2020/05/madurai-temple-gopura-2.jpg

Fig. 7: Sculpture of Lord Adinath-the first 'Tirthankara' of the Jains at Chaumukha temple, Rajasthan,
Source: Image courtesy- Gerard Janot,Retrieved from
https://upload.wikimedia.org/wikipedia/commons/2/21/Tirtankara.jpg

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Fig. 8: Use of an exemplary water conservation technique at Kund of part of Sun Temple

Source: Image courtesy-Kevin Standage, Retrieved from
https://kevinstandagephotography.wordpress.com/wp-content/uploads/2015/03/ksp_8372.jpg

Temples as Inspirations and Role Models for Society

It has been observed that Indian temples embody spirituality, community, art, and service values. They serve as beacons of spirituality and encourage people to seek inner peace, wisdom and enlightenment. Through rituals, prayers and meditations, they inspire believers to cultivate a deeper relationship with God and live a meaningful life based on moral and ethical principles. They represent the power of community and collective action, bringing together people from different backgrounds promoting unity, solidarity and mutual respect. Through festivals, cultural activities and social services, temples promote inclusivity, compassion and social cohesion.

The temples also include elements of the surrounding environment in architecture and landscaping. By using traditional water conservation methods, they ensure sustainable water use (Figure 9). In addition, indigenous trees and plants have been carefully integrated into their gardens, strengthening the regional landscapes and the connections with the surrounding ecosystems. Furthermore, temples are the epitome of art excellence and architectural wonder, showing innovation, craftsmanship and aesthetic sensitivity (Figure 10). Their beauty and grandeur inspire awe and admiration, while stimulating creativity and cultural pride. In essence, Indian temples serve as inspiration and models for society and remind us of the timeless values of spirituality, community, art and service.

Fig. 9: Water bodies in temple complexes demonstrating the presence of water as one of the five elements of Nature and water conservation tool. A-Sivaganga tank at Thillai Nataraja Temple Chidambaram, Tamil Nadu, B-Ramkund at Ram Dhun Temple, Bhuj,
Source: (A)Image courtesy-yaathith, Retrieved from-https://www.liturgicaltemples.com/chidambaram-thillai-nataraja-temple/ &(B) https://traveltalesfromindia.in/wp-content/uploads/2020/12/ramkund-baori.jpg

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Fig. 10: The Chennakeshava Swamy temple complex in Belur, Karnataka-a beauty carved in stone, a delight for the senses and a living proof of the awe-inspiring times of our ancestors. Surcharged with a confluence between knowledge of science and spirituality
Source: https://media.assettype.com/outlooktraveller%2F2023-09%2F73d3d0b8-15ac-4e1f-a330-45e6f756a22d%2FDepositphotos_98499974_DS.jpg?w=640&auto=format%2Ccompress

Elements of Neo-Vernacular Architecture

According to Rapoport (2015), any regions' cultural landscape is shaped by the exchange of its resources, populations, their cultures and history. Neo-vernacular architecture thus combines traditional architectural elements and modern design principles and technologies. Inspired by regional architectural traditions, it uses indigenous materials, local crafts and cultural motifs to create structures that harmonize with their surroundings. According to Chairuniza (2020), the neo-vernacular approach embraces sustainability and incorporates energy-efficient systems, passive climate control strategies and environmentally friendly materials.

Cole and Lorch (2003) are of the view that buildings and settlement patterns serve out to be the tangible manifestations of cultures that create them. They add that sustainability and regional culture cannot work in isolation since they are complementary. For technologies and techniques to be adapted in a region, the understanding of the local culture is essential. Srivastava (2023), points out that architects, masons and common people who are becoming aware will adopt best practices to integrate modern materials into vernacular architecture. However, Rajpu (2020) says that the combination of tradition and innovation not only honors cultural heritage but also responds to contemporary needs and environmental concerns, making neo-vernacular architecture a compelling way to develop sustainable and culturally rich design solutions. She further argues that the most prominent attributes of neo-vernacular architecture are harmony with site and surrounding, coherence with ongoing practices, vernacular influence, cultural adherence and energy efficiency (Figure 11).

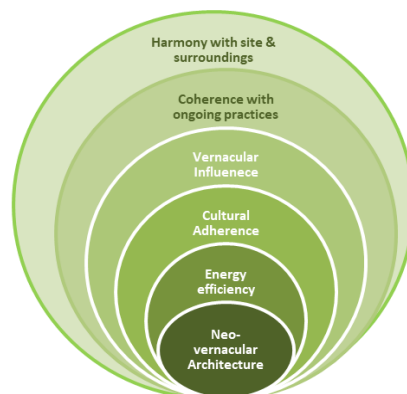**Fig. 11:** Elements of Neo-vernacular Architecture
Source: Author

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i.   **Harmony with Sites and Surroundings**

Rajpu (2020) elaborates that the purpose of the neo-vernacular design is to achieve seamless integration with the natural surroundings to avoid any dominance over the landscapes. Instead, it seeks to create a modest building structure. The coherence between the shape, material, and environment of the building creates a comfortable atmosphere and promotes a feeling of unity with Nature. During the design process, interior and exterior are mixed harmoniously, creating a strong connection with the natural environment, and façades are often designed to extend the environment within itself. Rapoport (1980) says, to fully understand the relationship between humans and Nature, it is important to go beyond the material aspects. The focus should be on the ethos of culture, and the features of environments and their interrelationships.

Furthermore, neo-vernacular architecture minimizes the environmental impact and embraces its existence if significant landscape elements are integrated into the planning of the site with due considerations of microclimate around the structure. Vegetation acts as a natural envelope of the building and extends the closed space for the inhabitants. Natural topography is used to save energy in the long term, and water bodies are often used to improve the overall environment and create a holistic and sustainable environment.

ii.   **Coherence with Ongoing Practices**

Rajpu (2020) further explains that contemporary architecture incorporates modern construction techniques to meet the user's needs and achieve desired strength and stability. The principles of neo-vernacular include the use of latest technologies that integrate ancient design philosophies and the demands of today. Chairuniza, (2020) is of the opinion that modern and traditional methods are often used to achieve sustainable goals by minimizing carbon emissions and energy consumption. Modern construction techniques have been carefully integrated with indigenous materials to ensure that the building resonates with the environment and time.

iii.   **Vernacular Influence**

Rajpu (2020) also explains that the loci of neo-vernacular architecture is located in the vernacular knowledge base. Neo-vernacular architecture considers historical elements adaptable and transformable and takes the forms of pluralism, selectivity and eclecticism to incorporate classical elements. It is about learning from the traditions to understand its inherent importance. Zographaki (1986) adds that this approach draws inspiration and lessons from the past, shifting the focus from the object itself to the message it conveys.

iv.   **Cultural Adherence**

While emphasizing on the cultural landscapes, Rapoport (2006) says that all human beings dwell in cultural landscapes which have been modified as per the human needs. According to Rajpu (2020), as internal planning is derived from the need of the owner's occupation and traditions, neo-vernacular architecture emphasizes cultural conformity, in which social and cultural aspects play a key role in the structure of spatial arrangement and relationships. The purpose of this architectural approach is to maintain a sense of security and familiarity with tradition while responding to the contemporary needs. Neo-vernacular architecture promotes symbolism and significance rooted within the local region. In this way, the past is reinterpreted and adapted to meet today's needs and ensures meaningful experiences for users.

v.   **Energy Efficiency**

Rajpu (2020) highlights that Neo-Vernacular buildings provide priority to energy efficiency by using passive design strategies tailored to the environment's climatic conditions. In order to reduce energy consumption, local materials with minimal environmental impact are used during construction. Chairuniza (2020) mentions that the careful consideration of the type of material used takes into account their energy and operating costs.

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Furthermore, the resources near the site are efficiently used to preserve the natural landscape. The buildings are located in the place to maximize energy efficiency and utilize natural topography to achieve the best performance. Orientation plays an important role in the location of buildings in order to benefit from wind direction and solar movement. Fenestration, corridors and courtyard are strategically located to improve ventilation and reduce the need for mechanical energy.

Research methodology

This research employs descriptive qualitative analysis as a research method. It is based on case studies of Indian temples chosen based on the characteristics and principles of neo-vernacular architecture. The three case studies are selected from three different parts of the country to prove the acceptability of neo-vernacular architecture style in varied contexts.

Data was collected from previous research, statements given by the project architects on their official websites and personal visits to the Lotus temple in New Delhi and the Temple of Shiva in Barmer, Rajasthan as case studies.

The Lotus temple in New Delhi, The Temple of Shiva in Barmer, Rajasthan and the Balaji Temple in Nandyal, Andhra Pradesh are selected as case studies due to their unique design approach and wisely adopted neo-vernacular approach in construction. These projects are understood as successful examples of neo-vernacular architecture styles and are widely acceptable and popular Indian temples which aim to offer an alternative to classical Indian temples. They offer a contemporary architecture from tradition and vernacular references rooted in place and its climatic and cultural context.

For the case studies, following steps have been followed:

1. Understand the ideas of the architects and their theoretical purposes for the projects through literature review and site visits.
2. Recognise the strategies applied in the temple designs by analyzing project drawings (plan, elevation, sections etc.), and conceptual sketches.
3. Through the observation of the photographs, it has been possible to find the achievement of the objectives intended by the architects.

Introduction to Case studies
Case Study 1: Lotus Temple, New Delhi

Lotus Temple in New Delhi is an architectural masterpiece that is well-known for its remarkable design and symbolic significance. The temple, designed by the Iranian architect Feribo Sahba, has been completed in 1986 and represents the Bahá' faith.

Its distinctive lotus flower-inspired shape consists of 27 freestanding marble clad 'petals' arranged in three tiers to form a majestic Lotus Flower that appears to be unfolding. This unique design symbolizes the purity, beauty and spiritual significance of Lotus flowers in various cultures (Figure 12).

Fig. 12: Lotus flower shape inspired LOTUS TEMPLE at New Delhi
Source: Image courtesy- I. Mahesh,.Retreived from
https://commons.wikimedia.org/wiki/File:An_Overview_of_Lotus_Temple.jpg

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Case Study 2: Shiv Temple in Barmer, Rajasthan

The Temple of Shiva in Barmer, Rajasthan, designed by Space Matters (Architect Amritha Ballal & Suditya Sinha) in 2016, is a testament to the cultural and religious heritage of the region, dedicated to Lord Shiva.

The traditional architecture of Rajasthan consists of complex sculptures, vivid colors and exquisite crafts, situated in the dry landscape of Rajasthan, but the temple is contrasting to this and comprising clean lines, earthy colors and no ornamentations; but still the temple is a cultural symbol that reflects the spirit and tradition of the local community in addition to its religious importance (Figure 13). It also represents the modern interpretation of temple architecture, uniting tradition and innovation, while maintaining symbolic significance.

Fig. 13: Shiv Temple at Barmer, Rajasthan
Source: Image courtesy-Akash Kumar Das, Retrieved from-
https://www.archdaily.com/786983/temple-in-stone-and-light-spacematters

Case Study 3: The Balaji Temple in Nandyal, Andhra Pradesh

Balaji Temple Nandyal is a temple located in Bilakalaguduru village of Nandyal district in Andhra Pradesh. The temple is dedicated to Lord Venkateswara, an avatar of the Hindu god Vishnu. The temple has been designed by Sameep Padora and Associates and constructed in 2019.

Fig. 14: Nandyal Balaji temple & its surroundings
Source: Image Courtesy- Edmund Summer, Retrieved from
https://www.architecturaldigest.in/content/andhra-pradesh-village-local-landscape-changed-by-jsw-cements-balaji-tirupati-temple-architecure/

The temple inspires devotees through its timeless architecture, religious symbolism, and spiritual teachings. It increases visitors' sense of devotion, humanity, and reverence for the divine. The temple's focus on energy efficiency, water conservation, and landscaping with native trees are key to minimizing the ecological footprint and encouraging environmental management. Community spaces and cultural heritage conservation enhance social cohesion and pride. The Barmer Temple is a holistic sustainable temple, balanced with economic, environmental and social objectives. The Shiv Temple transcends the role of a cultural, social, and spiritual center, not just a place of worship (Figure 14)

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Findings

Analysis of Case Studies based on Neo-Vernacular Architecture Elements and Ideal Indian Temple Features

All three case studies analyzed based on the parameters of the aforementioned neo-vernacular architectural elements and characteristics of Indian temples yield the following results:

Neo-vernacular Characteristics in the Lotus Temple, New Delhi:

i.   **Harmony with Site and Surroundings**

The temple, inspired by the lotus flower is located in the middle of greenery and ponds and seamlessly integrates into the environment to create a peaceful oasis. Its low profile and flowing contours echo the landscape and promote unity with Nature. Sustainable practices and eco-friendly materials further enhance this harmony.

ii.   **Cultural Adherence**

The temple is a symbol of deep symbolic expressions inspired by the Lotus flower, a sacred symbol of India, representing purity and spiritual awakening, and demonstrates cultural adherence. The 27 petaled lotus flower (09 leaves in all three layers) with surrounding 09 ponds reflects this spiritual importance and invites reflection on symbolic resonance. The number 9 has been considered as an auspicious number in Indian history, culture, and mythology. In Hinduism, there are nine planets, nine forms of Devi, and nine forms of Lord Vishnu, 9 precious gemstones. In addition, its inclusive philosophy encompasses unity and diversity and welcomes all faiths to gather and pray in harmony. By integrating cultural values, the temple is a testament to the legacy of India and its commitment to pluralism.

iii.   **Coherence with Ongoing Practices**

The temple achieved its environment friendly approach and exemplary craftsmanship through innovative approaches. The exquisite engineering skills used to create its iconic shape and intricate marble cladding show the excellence of modern technologies, reflecting the dedication to aesthetics and functionality. It uses abundant sunlight through solar energy, consistent with the adoption of renewable energy. In addition, a cooling evaporation technology that uses surrounding ponds focuses on forward-thinking environmental design and promotes energy efficiency and climate control (Figure 15). Through these practices, temples not only pay tribute to traditions, but also accept modern advances.
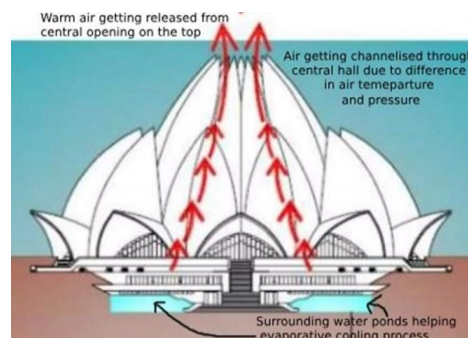

Fig. 15: Evaporative cooling technique used in Lotus Temple
Source: Retrieved from https://www.slideshare.net/hamzaaaaaah/lotus-temple-30764589#13, modified by Author

iv.   **Energy-Efficient Approach**

Through passive design strategies, the temple maximizes natural lighting and ventilation and reduces dependence on artificial energy resources. Innovative solar panels use renewable energies to further reduce carbon emissions. Its low profile and efficient building form improve thermal insulation and energy efficiency. In addition, the surrounding ponds contribute to passive cooling mechanisms and aesthetic appeal and promote energy efficiency.

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v.   **Vernacular Influence**

The temple is Inspired by Lotus flower, the pious Indian symbol is deeply rooted in cultural ethos and the temple reflects the vernacular ethos of symbolism and cultural significance. Using crafts makes respect for tradition in a contemporary context. In addition, its inclusive and community-oriented design reflects the principles of community gathering spaces and spiritual shrines.

Alignment of Architectural Features of the Lotus Temple with Traditional Indian Temples

vi.   **As landmarks**

As a landmark, its unique Lotus-inspired design attracts everyone's eye and becomes a symbol of city culture identity. The graceful silhouette against the skyline is a lasting proof of human creativity and innovation (Figure 16).

Fig. 16. Aerial view of Lotus temple & its surroundings, New Delhi
Source: Image Courtesy-Akshatha Inamdar, Retrieved from
https://upload.wikimedia.org/wikipedia/commons/9/9e/Aerial_View_-_Lotus_Temple.jpg

vii.   **As a Place of Assembly**

As a public gathering place with a capacity of 2500 people, the temple offers sanctuary to those who seek rest, meditation and community connection (Figure 17). The peaceful environment fosters a harmonious and inclusive atmosphere and welcomes people from all backgrounds to gather in a serene place with conviction of mutual respect.

Fig. 17: Gathering hall of Lotus Temple
Source: Image Courtesy-Bahá'ís of India, Retrieved from-
https://bahairecollections.com/2023/06/30/two-months-at-the-lotus-temple/

viii.   **As knowledge Resource Centers**

The main buildings' extensions are the adjoining buildings like offices, conference rooms, libraries, and the interesting museum complex, which serves as a knowledge center, a center for educational programs, seminars and exhibitions, which promote interfaith dialogue, cultural understanding, and intellectual enrichment. Through these initiatives, they encourage knowledge-based research and ideas exchange, foster tolerance and enlightenment.

ix.   **As a Reflection of Society**

The Lotus Temple reflects society's values and hopes and embodies the principles of unity, diversity and social responsibility. Its commitment to inclusion, environmental management and community engagement emphasizes its relevance as a gesture of positive changes in an increasingly evolving world.

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x.   **As an Inspiration**

The temple transcends religious boundaries and provides spiritual nourishment and guidance to those who enter its sacred spaces. Its tranquil atmosphere and timeless teachings inspire a deeper appreciation of the interconnectedness of all beings, including introspection, personal growth and deeper insight into the interconnectedness of mankind. A unique form and the use of excellent engineering skills continue to inspire designers, architects and engineers to produce such spectacular work.

New Delhi's Lotus Temple represents an amalgamation of architecture, spirituality, and social values and serves as a multi-faceted inspiration within the community and beyond.

Neo-vernacular Characteristics in the Shiv Temple in Barmer, Rajasthan

i.   **Harmony with Site and Surroundings**

The Shiv Temple in Barmer, Rajasthan, is seamlessly integrated with its environment and harmonizes with the region's drought landscape due to its rough local stone texture and simplistic geometric form. The temple architecture, located in rugged terrain, reflects a sense of the local environment and integrates natural elements of traditional Rajasthani design. Its location amidst the desert landscapes adds to the attraction of the temple and creates a serene and spiritually inspiring atmosphere for believers and visitors.

ii.   **Cultural Adherence**

The Barmer temple is a base of cultural commitment and reflects the rich traditions and ethics of the local community. Through its architectural design, the temple pays homage to traditional temple forms like pure geometry, high spire, locating a water in close proximity, axial approach to Garbha Griha, public gathering spaces etc (Figure 18 & Figure 19). Furthermore, the temple is a center of cultural activities and religious ceremonies that promote a sense of community and preserve ancient customs and rituals. Its importance extends beyond religious worship and acts as a cultural symbol celebrating and perpetuating the cultural identity of the Barmer region.
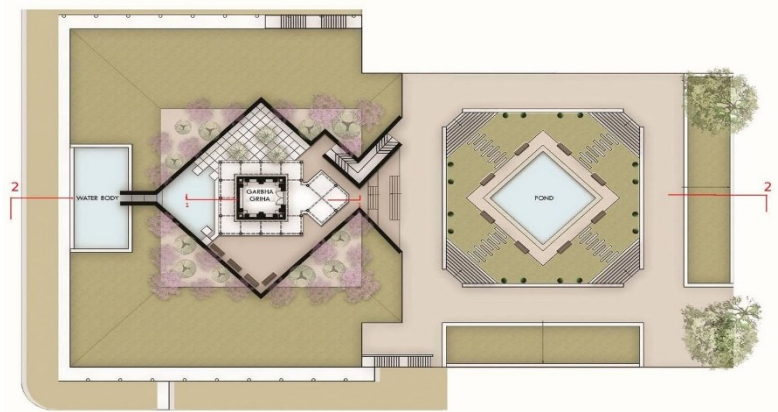

Fig. 18: Layout plan of Barmer Shiv Temple
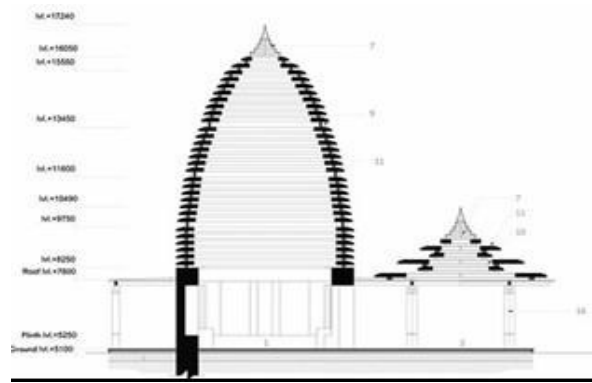Source: Retrieved from https://www.spacematters.in/temple-in-stone-and-light, Edited by-Author

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Fig. 19: Cross section (1-1) of Barmer Shiv temple- Following the Traditional Indian temple forms
Source: Retreived from https://www.spacematters.in/temple-in-stone-and-light

iii.   **Coherence with Ongoing Practices**

The temple in Rajasthan is an example of coherence with modern architectural elements with traditional themes and cultural authenticity. The artful layout of traditional stone masonry in the Shikhar of the temple permits light to penetrate inside during daytime and to let go out during night through slits. This playful phenomenon changes the aesthetics of the temple in different parts of the day.

Its structural innovations use solid stone plates, designed with new experimental approaches, to ensure stability and symbolize commitment to progressive technology (Figure 19, Figure 20 & Figure 21). In addition, natural light illuminates the temple during the day and incorporates energy-efficient LED lights with solar power at night, showing the harmonious integration of ancient reverence and modern environmental consciousness. These forward-thinking initiatives emphasize the relevance of the temple in the modern world by balancing sustainability and innovation practices, while preserving the sacred essence.

Fig. 20: Garbha Griha of Barmer Shiv temple filled with natural light
Source: Image Courtesy- Akash Kumar Das, Retrieved from-
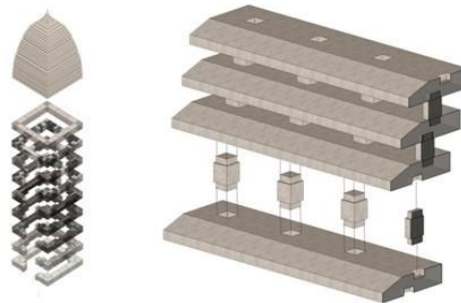https://www.archdaily.com/786983/temple-in-stone-and-light-spacematters

Fig. 21: Artful layout of traditional stone masonry in the Shikhar of Barmer Shiv Temple to get the natural light in the GarbhaGriha
Source: Retrieved from- https://www.archdaily.com/786983/temple-in-stone-and-light-spacematters/572d80c6e58ece5296000254-temple-in-stone-and-light-spacematters-detail

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iv. **Energy-Efficient Approach**

The temple adopts a sustainable and resource-efficient approach, reflecting its commitment to sustainability and resource management. The use of architectural features such as strategically placed windows and openings allows natural light to be abundant during the day and reduces the need for artificial lighting. It also integrates energy-efficient solar-powered LED lights that use renewable sources for night lighting. Taking advantage of the high water table of the site due to the reservoir for the power plant in the vicinity, which is unusual for desert landscapes, the temple's landscaping initiative involves the planting of nearly 200 trees that will form a lush forest area to improve aesthetics and microclimate. This strategic landscape not only beautifies the environment, but also shows commitment to ecological balance and sustainability. Through innovative design and technology, temples minimize energy consumption and maximize efficiency

v. **Vernacular Influence**

The Shiv Temple in Barmer showcases the local crafts and traditional techniques handed down from generation to generation. The main building material is yellow Jaisalmer stone, sourced locally, and pays tribute to the geology of the area, while maintaining architectural harmony. In addition, the inclusion of water and the adherence to the traditional form of temples with a parikrama path surround their cultural authenticity (Figure 13, Figure 18, Figure 21 & Figure 22). The presence of a gathering place follows the traditional temple layouts, promoting community participation. In general, the temple represents a harmonious combination of the Vernacular influences of its design and construction.
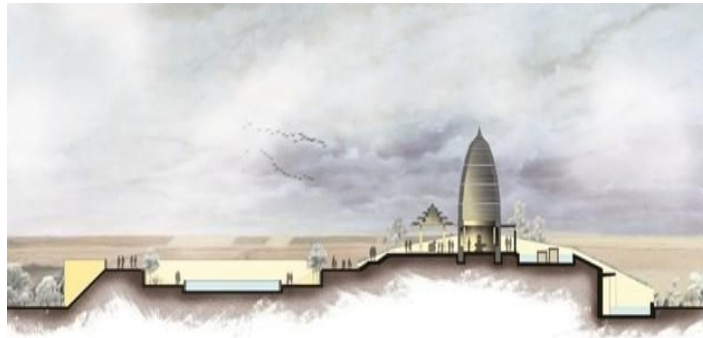

Fig. 22: Elongated section (2-2) showing Skyline of temple showing location of water bodies in Barmer Shiv temple
Source: Retrieved from https://www.spacematters.in/temple-in-stone-and-light

Alignment of Architectural Features of the Barmer Shiv Temple with Traditional Indian Temples

vi. **As a Landmark**

The Shiv Temple, which is a landmark in Barmer, Rajasthan, is an impressive architectural and spiritual monument that marks the cultural identity and religious heritage of the region. The distinctive silhouette against the desert background attracts both pilgrims and tourists and is an important interest point.

vii. **As a Place of Assembly**

In addition to its religious functions, the temple is a major public space in which people from all walks of life come together. It is a gathering place for community groups, cultural events and religious celebrations and promotes unity among believers and locals. The ground of the temple echoes with the sounds of prayers, chants and celebrations, creating a community harmony and a collective worship atmosphere.

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viii.   **As Knowledge Resource Centers**

The Shiv Temple preserves the ancient traditions of scriptures, rituals, and oral traditions passed through the centuries and passes it on to the future generations to follow. It serves as a source of spiritual guidance and enlightenment and provides insights into the existence of the Almighty. Furthermore, temples show ancient stone masonry techniques and structural simulations, allowing architects and engineers to refer to a live example. The temple's innovative use of light, artfully channeled through the slits between stone slabs of its Shikhars, showcases a fusion of tradition and creativity, offering visitors a glimpse into the intersection of heritage and innovation.

ix.   **As a Reflection of Society**

The Shiv Temple reflects the values, beliefs and opinions of the local community and embodies the cultural ethos and social fabric of Barmer, Rajasthan. Modern architecture, rituals and traditions reflect the customs, traditions and social structures of society, providing insight into people's collective thoughts and psyche.

x.   **As an Inspiration**

The temple inspires devotees through its timeless architecture, religious symbolism, and spiritual teachings. It increases visitors' sense of devotion, humanity, and reverence for the divine. The temple is also a model of sustainable development. Its solar energy, LED lighting and use of local materials initiatives demonstrate cost-effective strategies. The temple's focus on energy efficiency, water conservation, and landscaping with native trees are key to minimizing the ecological footprint and encouraging environmental management. Community spaces and cultural heritage conservation enhance social cohesion and pride. The Barmer Temple is a holistic sustainable temple, balanced with economic, environmental and social objectives. The Shiv Temple transcends the role of a cultural, social, and spiritual center, not just a place of worship.

Neo-vernacular Characteristics in the Balaji Temple in Nandyal, Andhra Pradesh

i.   **Harmony with the Site and the Surroundings**

The Balaji Temple in Nandyal harmoniously integrates with its surroundings, exemplifying the relationship between architecture and environment (Figure 23). The temple designed by architects Sameep Padora & Associates, blends modernity with tradition, reflecting Southern India's cultural heritage. Inspired by Andhra Pradesh's natural beauty, the temple's design honors its surroundings with a series of steps leading visitors through a spiritual journey. This architectural marvel meets locals' religious needs while providing visitors a tranquil spot, becoming integral to Nandyal's culture.
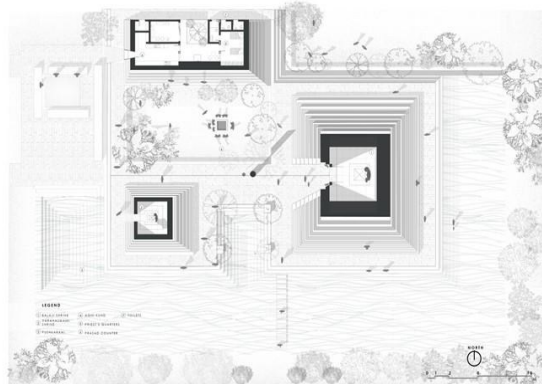

Fig. 23: Layout plan of Nandyal Balaji Temple following traditional axial & geometrical form with incorporation of water bodies, green lawns & steps around for gathering
Source: Retrieved from- https://www.archdaily.com/943320/temple-of-steps-sameep-padora-and-associates/5f0598b0b3576588b300035c-temple-of-steps-sameep-padora-and-associates-plan

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ii. Cultural Adherence

The Temple of Steps in Nandyal carefully maintains cultural traditions through its design that artfully blends modern architecture with longstanding Hindu customs. This creation is respecting the region's distinguished cultural history while fulfilling devotees' spiritual requirements. As a sacred place of worship and cultural icon, the Balaji Temple acts as the central location for community meetings, religious observances, and cultural programs, encouraging cohesion and pride among inhabitants and guests.

iii. Coherence with Ongoing Practices

The Balaji Temple seamlessly integrates with contemporary practices through an emphasis on simplicity rather than superfluous ornamentation, manifesting a modern and realistic approach to temple architecture (Figure 24). Crafted with a contemporary architectural style by Sameep Padora & Associates, its design prioritizes traditional Hindu principles while accommodating the needs of modern worshippers. Demonstrating a commitment to sustainability, an innovative water collection system taps local resources like black limestone to lessen environmental effects.

iv. Energy-Efficient Approach

The Balaji Temple project exemplifies an energy-efficient approach through innovative solutions tailored to its arid surroundings. Designers diverted wastewater from a nearby quarry to create a water retention basin, providing a sustainable water source. The temple's construction utilizes locally accessible black limestone slabs, minimizing transportation emissions and incorporating natural cooling mechanisms as well. The stepped temple forms adorned with greenery enhance aesthetic appeal and buffer interiors from heat, reducing artificial cooling needs (Figure 25). Through these initiatives, the Balaji Temple demonstrates commitment to environmental stewardship and energy efficiency.

v. Vernacular Influence

This case study draws inspiration from traditional architectural elements and indigenous practices. The stepped pond design pays homage to the iconic ghats of Benaras, creating a serene space for worshippers (Figure 25). The temple's layout mirrors a 10th-century temple in Tirupati, featuring shrines and a water tank mirroring ancient temple tradition .Using locally available black sandstone adds to the temple's authenticity and sustainability. Indigenous plantation further connects the temple to its surroundings, fostering harmony with nature and cultural continuity.

Fig. 24: Purely geometrical form of temple tower without superfluous ornamentation with green bedded steps around
Source: Image Courtesy-Edmund Sumner, Retrieved from-
https://images.adsttc.com/media/images/5f05/9548/b357/655d/4600/022b/slideshow/SP_A-TEMPLE%C2%A9Edmund_Sumner-078.jpg?1594201393
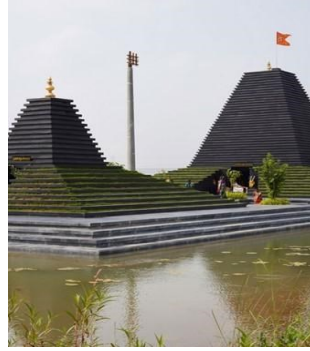
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Fig. 25: Water bodies around temple structure giving cooling effect
Source: Image Courtesy-Edmund Sumner, Retrieved from- https://www.archdaily.com/943320/temple-of-steps-sameep-padora-and-associates/5f059586b3576588b300035b-temple-of-steps-sameep-padora-and-associates-photo

Alignment of Architectural Features of the Nandyal Balaji Temple with the Traditional Indian Temples

vi.   **As a Landmark**

The Nandyal Balaji Temple is a renowned landmark located in Andhra Pradesh, India. Both pilgrims and tourists are drawn to visit the temple due to its distinctive architectural style and spiritual importance. Featuring a stepped design, the temple is set within tranquil surroundings, giving it an iconic status as a symbol of faith and cultural history within the local region. As a treasured landmark, the temple functions as a focal location for religious rituals, cultural festivals, and plays a pivotal role representing both the spiritual and social elements of the Nandyal village community.

vii.   **As a Place of Assembly**

The temple functions as an essential location for convening, bringing together worshippers and visitors from varied backgrounds to participate in religious rituals and spiritual contemplation. The tranquil surroundings, distinctive temple structure with stepped platforms encircling a large interior assembly hall serve as a communal gathering place for cultural events, cultivating a sense of unity and fellowship among the local community. Whether for religious observances or social occasions, the temple offers a sacred sanctuary enabling collective worship and collective experiences.

viii.   **As a Knowledge Resource Center**

The Nandyal Balaji Temple serves as a knowledge resource center dedicated to preserving ancient traditions and spiritual teachings. Through scriptures, educational programs, and cultural events, the temple enables learning and cultivation of understanding of Hindu philosophy and cultural heritage. As a hub for religious discourse and intellectual exchange, it enhances the community with enduring wisdom and guidance. Furthermore, by illustrating how ancient wisdom can be applied to modern development, the temple motivates architects and builders to develop structures respecting cultural significance, environmental stewardship and advancing the evolution of temple architecture.

ix.   **As a Reflection of Society**

The project reflects the core values and aspirations of the community, representing the cultural heritage and spiritual traditions of Andhra Pradesh. Its architectural magnificence and collective ceremonies provide meaningful perspectives into the collective identity and social dynamics of the local community. As an esteemed symbol of faith and worship, the temple serves as a manifestation of societal convictions, cultivating a sense of cohesion and pride among both congregants and guests.

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x.   **As an Inspiration**

The Balaji Temples serve as icons of inspiration, demonstrating architectural expertise through its extraordinary design approach and innovative characteristics. Their sustainable methodology, utilizing locally available materials and water collection systems, fosters environmentally conscious construction practices (Figure 26, Figure 27 & Figure 28). Their synthesis of tradition and progress inspires individuals to contemplate profound spiritual truths and find solace in their faith. As representations of cultural heritage and spiritual dedication, urging communities to adopt sustainable progress and preserve their rich cultural legacy for future generations.

Fig. 26: Stepped platform with green cover providing a soothing environment
Source: mage Courtesy-Edmund Sumner, Retrieved from-https://www.archdaily.com/943320/temple-of-steps-sameep-padora-and-associates/5f05950cb357655d4600022a-temple-of-steps-sameep-padora-and-associates-photo?next_project=no
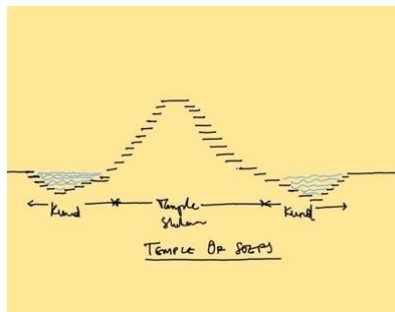

Fig. 27: Skylight and pyramidal form of Garbha griha shikhar
Source: Retrieved from-https://www.archdaily.com/943320/temple-of-steps-sameep-padora-and-associates/5f0598c9b3576588b300035d-temple-of-step

Fig. 28: Sketch showing Architect's perception for incorporation of kunds
Source: mage Courtesy-Edmund Sumner, Retrieved from- https://www.archdaily.com/943320/temple-of-steps-sameep-padora-and-associates/5f0595a4b357655d4600022c-temple-of-steps-sameep-padora-and-associates-photo?next_project=no

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Conclusion

The adaptation of neo-vernacular architecture in contemporary Indian temples represents a pivotal moment where tradition meets innovation to redefine the built environment. This style holds importance in preserving cultural heritage while addressing evolving societal needs. Architects and designers adopting neo-vernacular architecture style, serve as catalysts for its promotion. Their creative reinterpretation of vernacular elements breathes new life into traditions, fostering dialog between past and present.

Various theories and concepts conclude that neo-vernacular architecture is characterized by its harmony with the site and surroundings, coherence with ongoing practices, vernacular influence, cultural adherence, and energy efficiency. These key elements ensure that the design is not only aesthetically pleasing but also environmentally sustainable and culturally relevant.

It is thus concluded that Indian temples have historically served and continue to serve an important role in society in terms of acting as landmarks due to their aesthetical and cultural value. They function as assembly places to discuss agendas of common goodness & performing rituals, playing a role of resource center and educational institution, reflect societal trends and beliefs influenced by the social, political, and environmental conditions of their times. Most importantly, they inspire and motivate society to uphold good practices.

It is concluded that by juxtaposing the well-articulated elements of neo-vernacular architecture and traditional roles of Indian temples, and adapting the architectural approach of the Lotus Temple, Nandyal Temple, and Balaji Temple, the architects have successfully blended tradition with modern needs, creating exemplary models of Indian temples built with a neo-vernacular Architecture approach.

This study highlights that as temples occupy a central place in Indian society; adopting neo-vernacular architecture signifies a paradigm shift, challenging norms and exemplifying tradition-modernity fusion. Widespread public appreciation and acceptance of unconventional temple designs signify a positive shift towards architectural diversity, reflecting broader societal openness to innovation. Moreover, applying neo-vernacular architecture principles into architectural endeavors can advance sustainability and promote healthier communities.

Although this research limited the focus mainly on architectural rather than religious or spiritual aspects of the temples, the finding underlines that adopting neo-vernacular architecture serves as an inspiration and guides us towards a more harmonious and sustainable built environment. In this narrative of transformation, neo-vernacular architecture emerges as a tool for cultural preservation, societal progress and environmental stewardship. Embracing this ethos can pave the way for a more inclusive, resilient and culturally enriched future.

This statement given by a pioneer of modern architecture summarizes the theme-
"Architecture is the will of an epoch translated into space."
-Mies Van Der Rohe

Scope of Future Research

Future research could focus on implementing neo-vernacular architecture and sustainable practices in public buildings such as schools, colleges, and recreational spaces. Investigating how these architectural choices impact the perceptions and behaviors of children and younger generations can help in framing strategies for facilitating long-term societal change. It is important to understand how early exposure to such environments shapes future attitudes towards sustainability and traditional practices, which is critical for cultivating a sustainable and culturally enriched society.

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