Role of Construction Methods in Shaping Neo-Vernacular Architecture: Insights from the Master Builder Nari Gandhi in India

Pratheeksha, Vibha Gajjar & Sujan Umaraniya
Institute of Architecture and Planning, Nirma University, Ahmedabad, Gujarat
Email: arpratheeksha2024@gmail.com; vibha.gajjar@nirmauni.ac.in; sujan.umaraniya@nirmauni.ac.in

Received	Accepted	Accepted
15.09.2024	10.09.2025	30.09.2025

https://doi.org/10.61275/ISVSej-2025-12-05-09

Abstract

The "synthesis of existing and new" in architecture is recognised for its ability to revitalise vernacular history and incorporate it into contemporary societal trends. The historically significant physical arrangement and the uniformity of the materials and construction methods serve as tributes to their past. 'Neo' means new while vernacular indicates the utilization of native materials and techniques with the robustness of natural environment. Neo-vernacular architecture contributes by fusing modern specifications and technology with vernacular design tendencies. Many Indian masters have studied this nuance; architects like Nari Gandhi offer us an insight into the neo vernacular style. This research investigates role of construction methods contributing in creating the connection between old and new buildings using works of Nari Gandhi.

A framework developed from a literature review is used to explain the research. This paper discusses the neo-vernacular architecture through the selected works of Nari Gandhi. The paper uses case study approach along with semi structured interviews to compare construction methods used by Nari Gandhi. This paper checks for the consistency and variation of construction method in selected case studies with their contextual vernacular structures.

It provides key aspects that could serve as a principle for architects to design spaces that are more rooted to their region and culture. A note on decisively using certain building materials and techniques to support neo vernacular architecture concludes the research paper.

Keywords: Construction methods, Neo-vernacular architecture, Vernacular architecture, Nari Gandhi, Regionalism

Introduction

Architecture has evolved over the period of the years, has become modern and will continue to evolve. Still however, the term vernacular architecture holds a lot of significance to this day and age. Apart from being sustainable, this architecture had an identity of its own. Further, this style of architecture was holistic as even the mason was equally involved in the

designing of the building. All the persons from master craftsmen to mason were contributing towards development of the physical form of a building. It may therefore be claimed that the development of vernacular architecture benefited from a variety of contributions made as part of a cultural practice. Since human evolution, architecture and culture have been inextricably linked. (Gajjar, et al., 2022)

However, the regional nature of vernacular architecture which gave voice and identity to different regions of India has been lost due to the advent of modern architecture. At times, a modern house of Mumbai is similar to that of Ahmadabad due to the shared concepts and construction techniques. The level of comfort and familiarity that one feels in a vernacular house is lost in most of the city houses today. Therefore, these constructed structures are subject to variation across regions, as they are influenced by distinct cultural and social norms. (Rapoport, 1969). However, the intermingling lifestyles and cultures have rendered the spatial layout of vernacular architecture incompatible to this day and age. If the house designs are understood as technical adjustments to the socioeconomic limitations of a community, then Rapoport's concept of constraints can be linked to them. Further, the more fundamental question is to comprehend the feasibility of our origins while simultaneously being progressive and considerate of modern needs. The paper emphasizes the need for new designs to align with these traditional elements to foster a cohesive architectural identity in the face of modern development pressures. There are definite connections between the indigenous typology and urban settlements, despite the fact that lifestyle and work patterns in rural and urban areas have altered. (Umraniya & Menghani, 2022). This implies that a construction method can adjust over time to changing environmental, technological, and economic constraints. The paper emphasizes that vernacular architecture is not static; it evolves over time due to changes in technology, social needs, and external cultural influences. This dynamic nature allows for adaptations in the building's shape and function while still maintaining its cultural significance (Nasution, 2012). The introduction of new technologies has led to changes in the construction methods and materials used in buildings. (Nasution, 2012) While traditional techniques are still valued, modern materials and methods are increasingly incorporated, reflecting a blend of old and new practices in neo-vernacular architecture. Neo vernacular design integrates contemporary materials and technologies while building on the ideas of vernacular architecture. Many architects demonstrate how they combine conventional design components with modern building techniques.

The paper particularly examines the modern Indian vernacular architecture in the works of renowned architect Nari Gandhi. Neo-vernacular, also known as contemporary vernacular, is primarily an architect's interpretation of what a modern vernacular would look like. This could be achieved by using construction technique, available materials, or spatial expression to highlight vernacular approaches. The architect could explore this either in totality by considering all three factors or by partial exploration by considering vernacular in only some of the aforementioned factors. As a result, the only area of concentration for this study will be the use of building technology in Nari Gandhi's architectural expression and his integration of vernacular architecture into his modern residential designs.

This research aims to decode the constructional aspect involved in neo-vernacular architecture, through Nari Gandhi’s works. Following is the list of objectives:

a. To understand neo-vernacular architecture.
b. To analyze the neo-vernacular architecture in Nari Gandhi’s designs.
c. To compare construction methods of Nari Gandhi’s work with the traditional methods
d. To derive key design principles promoting neo vernacular style.

Theoretical Framework

The foundation of the entire study work is a knowledge of vernacular architecture and its applicability in the modern day. The passage from the literature review that forms the basis of this paper's theoretical framework will be explained in the narration that follows. This study examines the particular facets of construction technique that were examined in the case study.

The selection of works by architect Nari Gandhi is predicated on an examination of his perspectives on the advancement of regional architecture. We'll talk about his ideas and philosophy in order to illustrate how his creations connect to neo vernacular architecture. As it is analyzed, the study's framework is created from the perspective of building.

Vernacular Architecture

Etymologically vernacular architecture means domestic architecture as 'vernaculus' in Latin translates to 'domestic'. (Monalisa, 2010) (Oliver, 1997). Related to the environmental contexts and available resources, they are customarily owner or community built, utilizing traditional technologies. In simple words it is the architecture of the past, practiced by a certain region or community of people as a whole. Recognizing this architecture and its relevance and importance in modern times, is a major contribution of two pioneers of this subject- Bernard Rudofsky and Paul Oliver. (Rudofsky, 1965) (oliver, 2006) Research done in this subject took into consideration the social, economic, cultural and technological aspects of vernacular architecture. Nevertheless, the majority of this research is restricted to the vernacular architecture of other countries; no comprehensive study or book has been created to address the Indian context.

Indian vernacular architecture today may not be purely vernacular. However, it is more of an adaptive style of architecture that is more informed and sensitive about the climate and its context. The five characteristics or lessons of vernacular architecture derived on the bases of literature review are further explained, to get the better understanding of it.

Aesthetics: Aesthetics can be defined as a sensation that invokes pleasure and displeasure through visual artefacts or elements. "With reference to architecture, aesthetics could be a design element that makes the building look pleasant or appealing visually." Architectural aesthetics is the study of a building's attractiveness or visual appeal. Shape, colour, texture, form, and proportion are all included while analyzing the aesthetics. (Gajjar & Bhavasar, 2019) However, the aesthetics should not be confused with beauty. Beauty is a part of aesthetics, but not all of it. Aesthetics in a building could be explored through adaptable motifs, facade designs and details, familiar textures in finishing and non-formalized design and proportions. This choice of materials is essential for maintaining the structural integrity and aesthetic appeal of the houses, which are often characterized by intricate designs and spatial arrangements (Dongre, 2019).

Functionality: Vernacular architecture was based solely on the needs of the people as the owner/resident was also a direct participant in the process of construction of the building. Vernacular architecture had optimal layouts of space and forms suited to their day-to-day activities. The scale and proportion of the built form was in harmony with the human scale and every built element had an anthropometric relationship with the user and their activities. Circulation within the residence was efficient with plenty of ventilation while protecting the privacy of the residents.

Sustainability: The built environment was in harmony with and responded to the local climate. Materials used for the construction were obtained and produced locally. The methods used in construction created less wastage of materials further adding onto the sustainability of the building. The process of construction as a whole produced lesser pollution than modern construction. Even the social and cultural aspect were part of built environment which promoted social sustainability. The Pol houses of Gujarat reflect the cultural and social values of the community, showcasing a unique architectural style that has evolved over time to meet local needs and climatic conditions (Dongre, 2019). The construction techniques have been adapted to the socio-cultural and climatic contexts of the region, contributing to the houses' functionality and sustainability. (Dongre, 2016)

Structure: The vernacular architecture developed and sustained through centuries in a region. One major reason for this can be associated to its structure that is in as much harmony with the user as it is with the regional physiography. The structure has been evolved to sustain not just the everyday weather but also to fathom the unpredictable natural disasters.

Cognitive: This can also be termed as the imagery that is associated with such residential typologies. These imageries are not only the result of their final form, but the intricate detailing done by the then local craftsmen also play a huge role.

When one or more of these five aspects correspond to the vernacular typology it can be considered as neo-vernacular architecture, Permutative exercises conducted on the above five parameter generates a prototype for the modern usage. Such designs lead to the genesis of neo-vernacular architecture. Authors, Monalisa and Pushpalata in their journal article on regionalism and revivalism in neo-vernacular architecture, describe neo-vernacular architecture as a modern orientation in architecture where these vernacular lessons are juxtaposed with the changed contemporary context.

Neo-Vernacular Architecture

Neo-vernacular architecture is an extension of previous techniques for comprehending structures, areas, and human requirements. (Turkušić, December 2010).One major nature of vernacular architecture is its ability to adapt. Indian vernacular architecture continued to evolve up until the arrival of foreign influences, with each generation including ever-more-detail-oriented elements. However, Indian original architecture has been impacted by a variety of other foreign cultures, depending on the administration it was constructed

Features of Neo-Vernacular Architecture

The initial usage of the word ‘neo-vernacular’ can be first observed in the book of Jencks, where he defined it as “the architectural style with the use of pitched roofs, chunky detailing, picturesque massing and brick” (Jencks, 1984). Neo-vernacular is a style of architecture that holds some vernacular lesson while paving a way for the futuristic aspirations of modern-day architects. Thus, new constructions should harmonize with the existing architectural language, thereby preserving the identity and continuity of the neighborhood. This approach is crucial for addressing the challenges posed by contemporary developments that often disregard traditional construction methods and materials (Dongre, 2019). The choice of materials is crucial in both vernacular and neo-vernacular architecture. The interviewed architects discuss their preference for locally sourced materials, which not only supports the local economy but also minimizes the environmental impact associated with transportation. (Sanyam Bahga, September 2020). They often utilize materials that are well-suited to the local climate, such as mud, stone, and bamboo, which have been traditionally used in the region

To understand neo-vernacular better, one can look at the features that affect neo-vernacular architecture. One of the prominent aspects can be usage and exploring the potential of local material. Thus, Neo-vernacular architecture advocates the use of local materials as these are both sustainable and resilient to their native climate.

1. Response to climate: Buildings are built with more consideration to the type of climate they are built in. This is done to ensure more thermal comfort to the users.
2. Response to site: The immediate site dictates the design decisions.
3. Response to culture: The vernacular architecture was culture-based architecture. Hence, a tint of the past cultures could be found either through the motifs, facade details or the basic layout of the space.
4. Construction methods/techniques: Often, construction techniques from the vernacular colleagues are introduced to make the design more sustainable and regional.

Most of the neo-vernacularism explored by the architects, in India, has been concerned with the methods of the construction and the building. Most of architects well known for their

modernist kind of works, have also, at times, developed works, that played around the idea of vernacularism."Right from 20th century, modern international style of Architecture has influenced the built forms globally. Cement, steel, glass and concrete have dominated the entire building industry. Mass production, modular forms, cost effectiveness, durability and strength are advantages which a naturally occurring material cannot achieve." Srivastava & Das, July 2023

However, buildings designed by well-known Indian architects have shown their gratitude towards the vernacular architecture. One fine example could be of the 'Delhi Handloom Pavilion designed by Charles Correa in 1985. "It consisted of sixteen cable-supported parasols with an open square at the center. Later in his career, the Belapur housing also known as the 'artist's village is another example designed by the same architect revolving around the vernacular sentiments." (Lang, 2002) In the Indian regional context, architects have been attempting to revive lost abilities and further decipher newly generated skills resulting from technological advances by mixing traditional materials like bamboo, mud, stone, bricks, and recycled materials into their designs. Further, many architects have found passive design solutions for a thermally comfortable residence coded into the vernacular style of the region. Out of many masters practicing in Indian context and preaching the vernacular architecture Nari Gandhi's work would be discussed in detail through this paper.

Research methodology

Descriptive comparative analysis of construction technology is the research method used in this study. To demonstrate the appropriateness of the neo-vernacular architectural style, two case studies were chosen from distinct regional contexts. Both case studies were developed during same timeline having regional influence as well as exploration of material and construction technique.

The research has created a framework for study and derived a detailed understanding of neo vernacular architecture and constructional aspects using the existing literature review. A detailed case study examination is conducted on a selection of works by Nari Gandhi, a modern master known for advocating for regional vernacular architecture. The case studies were chosen based on the timeline of when material investigation became possible for construction technological nuance. Secondary sources were used to acquire preliminary data for two chosen case studies utilizing a drawing set. Through a personal site visit, photo recording, and semi-structured interview, the detailed investigation and validation were carried out.

Construction methods and neo vernacular Architecture

The introduction of new technologies has led to changes in the construction methods and materials used in building as quoted by researcher (Nasution, 2012) for city Bagas Godang. While traditional techniques are still valued, modern materials and methods are increasingly incorporated, reflecting a blend of old and new practices in neo-vernacular architecture. The use of modern materials in experiments creates opportunities for developing building systems and highlights the neo vernacular statement in architecture. While an architect's choice of materials and construction methods is ultimately up to them, it is recommended that they embrace the local characteristics of the site.

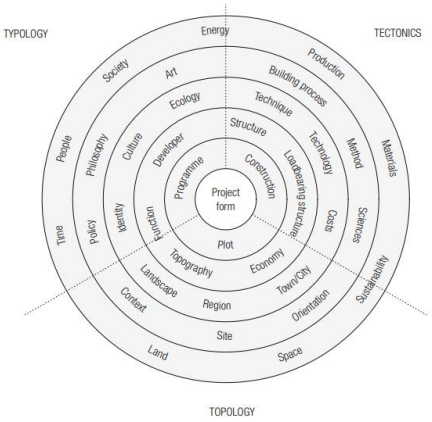


Fig. 1: Form-finding process.
Source: Andrea Deplazes, 2005

Since the major goal of this research is to map the constructional evolution in the evolved ideology of vernacular architecture, it is essential to generate a method to quantitatively analyze the same. According to Kenneth Frampton, the existence of built is based upon three major factors: topos, typos and tectonics as shown in figure 2(a). This research is an attempt towards understanding the tectonics of the building and it is necessary to generate a study framework to analyze building from a construction perspective. The flowchart has been derived from the book, "Constructing Architecture" by Andrea Deplazes. (Deplazes, 2005) use generate understating in the sequence of construction. From the sequence of construction, the visible elements are taken for studying excluding the foundation which remains as invisible entity.

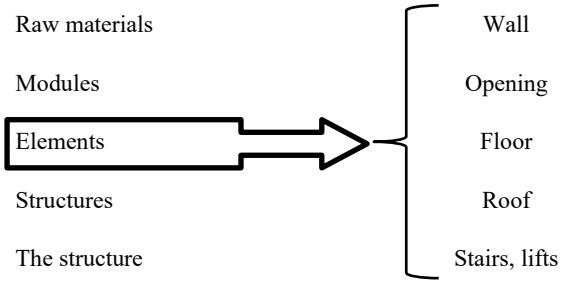


Fig. 2: The sequence of architectural construction as an additive chain from small to large
Source: Based on framework of Andrea Deplazes, 2005

Nariman Gandhi and Neo Vernacular Architecture

Nariman Dossabhai Gandhi, popularly known as Nari Gandhi was an Indian architect born to a traditional Parsi family. "Nari Gandhi learned Wright's innovative design techniques and organic architecture philosophies." (Bahga, 2024)Gandhi had practical experience working with Wright on a variety of tasks, going beyond merely theory. Gandhi's inventiveness and skill as an architect were greatly enhanced by this hands-on training. Heavily influenced by Frank Lloyd Wright's concept on organic architecture, Nari Gandhi has assimilated and re-conceptualized the term to suit the Indian context and culture in his structures.

As previously discussed, neo-vernacularism can be found in the works of many architects. Nari Gandhi's approach towards architecture was based on totality and can be related to vernacularism through his emphasis on the role of masons. Further, the interrelations between his constructed buildings were so complete, from the basic design to the furniture layout, all received the same care and detailing. He constantly supervised the work on the site, at times, training even the unskilled labors to create the final product equivalent to the level of art. "Gandhi was willing to experiment with new forms, materials, and construction methods. This encourages contemporary Indian architects to push boundaries and explore innovative solutions using cutting-edge technology." (Bahga, 2024).It showcases that his works were rooted in vernacular typology yet shaping the way for neo vernacular typology. He experimented and adopted advance construction method to set up contemporary vocabulary for neo vernacular architecture.

Philosophical Attitude of Nari Gandhi

The following points are the few reasons for finding works of this architect suitable for the purpose of the study.

Individualism

Nari Gandhi believed in the individuality of a man. That, the primary responsibility of the house is to function well to its residents. He created unique relations with his clients. He began all his projects by first understanding the nature and needs of his clients. Thus, his clients were beyond mere people who gave him a project, they were his friends, where the friendship most of times lasted beyond the project timeline. The projects were custom made according to the nature of each client, essentially at times, not giving what the clients wanted, but what he thought would suit them better.

He was a very keen observer noting down the mental images and perceptions of the people he met. If this was insufficient, he would hold long discussions with clients, discussing all concerns of construction at the initial phase of their meetings. He would connect with all the members of the family, at times even their pets, to understand the way the family would function in the house. (Taj, 2009) Once clear about his design, he would expect as little intrusion from the clients as possible, so that he could create designs beyond their immediate interests to one that would be rewarding for their lifetime.

Strong Contextual Design

Nari Gandhi strongly believed that the house grew out of its surroundings. The contextual response could be seen in Nari Gandhi's designs in two components: material choice for the residence and the form of the house. The context and activities taking place inside the homes had a significant impact on the design of the buildings. Rain-prone areas, primarily in Maharashtra, are home to sloping roofs, whether they are on a private home or an apartment penthouse.

Endorsed indigenous knowledge through masons

Nari Gandhi created a participatory environment during the process of the construction of the built where the masons were also creatively involved in the designing of the building. As he personally supervised the site, many a times, if he would not be satisfied with the final form of any element create by the masons, they would be asked to redo it. He would at times, personally train masons to realize the kind of form he imagined; however, the final outcome would be left to the creative freedom of the mason.

Longevity of Structures

Nari Gandhi used local materials, which suited the ecology and the climate of its region. The structures he incorporated in his designs, further, enhanced their stability to not only daily climate but also natural disasters at time. During the visit to Korlai bungalow, the caretaker of the residence explained how a recent cyclone had left the residence unharmed while a tree existing just behind the structure had been bent a lot from its original position. The structure of the Korlai bungalow was on arches which opened up completely towards the sea, while the rooms of the buildings were placed on the ground floor whose floor level was lower than the surrounding ground. Thus, the cyclonic winds passed through the structure with very little obstruction.

Foreign Concepts of Frank Lloyd Wright

Studied under the father of architecture for almost four years from 1956 to 1961. Wright himself is known to advocate vernacularism. He often looked into various other cultures to learn from their vernacular architecture. He studied the Japanese and Italian architecture. This influence can be further seen in Nari Gandhi who believed that the traditional heritage of construction was a sign of strength and growth. He applied the concepts of Frank Lloyd Wright

but to suit the Indian context. The unpublished research work in the thesis titled "Universal and the contextual: influence of Frank Lloyd wright on contemporary Indian architecture" of Ar. Urvi Desai talks in depth regarding various influences of Frank Lloyd Wright's principles in the architecture of Nari Gandhi.

Materials Exploration

One of the major explorations by the architect is done in his use of different materials. He expressed materials differently paying closer attention for their associational values and nature. His structures exploited materials to its maximum while maintaining the purity of the form. "Nari Gandhi used bricks, stone, steel and timber as structural materials. Bricks and stone were his favorite and he used them in fresh inventive ways creating different forms and finishes." (Gore & Chhaya, 1996)

Nari Gandhi kept exploring, creating various expressions within the material where he took on a combined role of both an inventor as well as artist. He kept improving with each project he took, adding that lesson to his next project. Moreover, the fact that he was present on site during the entire period of construction, often improvising his own designs while not losing the sight of his initial design is in itself a work of artistry that he imparts to each of his design in great detail. However, the research understands this topic through the lens of construction methods only. Further, the research shall be looking at two of his case studies in detail to understand how each of the usual elements of construction, like roof, windows and walls are detailed in the residences designed by the architect to imbibe the regional quality.

Case Study of Vernacular Architecture

To understand whether the old had any relevance to the present, it is first necessary for architects to understand the essence of our vernacular architecture and the regional diversity. The vernacular architecture of any region is decided by its climate, culture and construction. The land and the climate of the region decide upon the materials available in the regions. For example, the major materials available in the hot and dry regions of North-western part of India use locally available stone and timber. The warm and humid parts that cover the India coastal belt, observe construction with materials like, laterite, mud, thatch, coconut leaves, granite, timber, bamboo and Mangalore tiles.

The cultural factor dictates the spatial qualities of the houses. For example, the Southern India where land as a resource was plenty observe a front yard and a backyard integrated within the residential layout. The Maharashtrian wadas observe two courtyards, one closer to the entrance of the house with more public feature while the other was smaller in scale and was catered to only the residents. The construction technology leads to three types of vernacular architecture: semi pukka, pukka and kuccha depending on if and how much the natural material has been processed.

Fig. 3: Location of the case studies in India

1: Suryakant Patel's house
2: Korlai Bungalow
Source: based on https://i.pinimg.com/originals/b5/1c/c1/b51cc184e36a0615be64973f42be1ad0.gif

This research paper studies two vernacular architectural typologies located in two different regions of western India as shown in figure 2. One of them is in Surat, southern part of Gujarat state while the other region is closer to Alibaug- Revdanda. Maharashtra state, India. The documentation of Surat's architecture reveals influences from various styles, including local traditional, Arabesque, Colonial, and Art Deco. (Malhotra, 2011) This blend of styles showcases the city's rich cultural heritage and the evolution of its architectural identity over time. While other case study is located in Konkan belt of Maharashtra where the heavy rainfall gives a sloping roof exploration as the best climatic response to vernacular typology.

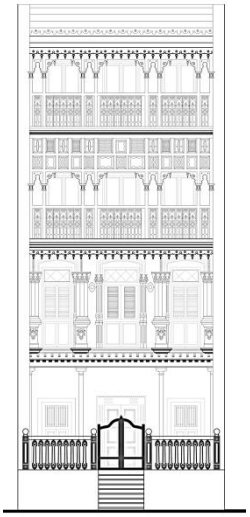


Fig. 4 Elevation and part section of Surat Pol House
Source: https://www.sahapedia.org/the-architecture-of-houses-deputy-no-khancho-old-surat

Vernacular Architecture of Surat, Gujarat

The vernacular architecture of Surat shows the housing typology of "pol housing which is famous in region of Gujarat state. "Pol is derived from a Sanskrit word 'Pratoli', which means the main road or the royal road. However, Pol in Gujarat stands for a closed road with one big entrance." (Dongre, 2019), Pols were constructed through locally available materials like brick and timber and built from local craftsmen.

They had rectangular house form longer on Northern and Southern facades. The longer facades are porous with many openings for better ventilation within the building.

The house followed mostly frame structure form of construction, with wooden columns and brick walls with lime as a bonding material. The lintels and the brackets of the wooden columns were detailed with wooden carvings of floral patterns of mango trees and foliage of local vegetation while the center depicts Kalash and Lord Ganesh. Facades were simple, yet elegant with wooden carving.

Extended roof slabs can be observed rather than having chajjas for protecting the windows. This creates an extra space on the floor above, which is utilized as balconies. "Three types of balconies can be observed in the Pol Houses of Surat- balconies with screen, Jharokha-like balconies and long and continuous corridor-like balconies, supported on a series of columns." (Malhotra, 2011). Wooden staircases, mostly like a ladder with typical details can be found in the pol houses, since these were constructed to save as much space possible on the ground. Two types of roofs can be found, both flat slab as well as shallow pitch roof.

Vernacular Architecture of Revdanda, Maharashtra

These regions mostly fall under the Konkan division of Maharashtra and are prone to tropical climate with heavy monsoon rains. They mostly cover the coastal belt of Maharashtra. The basic image created of such houses is of thick laterite or brick walls supporting cantilevered sloping roofs

.

Fig. 5: Section of a typical vernacular house in Revdanda
Source: http://www.ceptarchives.org/Content/images/Item/b0ef17d7dfe84f8b867bdedbc37cfa28.jpg

Houses are built on raised plinths to protect the houses in case of flooding. Laterite or thick brick walls with lime plaster are characteristic features. Locally made bricks which are mostly sun-dried are used. They can be load-bearing, in case of frame structure; wooden columns with elegant carvings are used. As for windows, medium-sized plenty windows were provided for better cross-ventilation and to increase thermal comfort. The major feature of such houses is the verandas. These could be both front yard ad backyard. Shaded spaces of verandas acted as extended outdoor living spaces. If built on a larger scale they even incorporate courtyards for cross-ventilation. Steep sloping roofs covered with Mangalore tiles extended beyond the walls form the top most layer of the house. An attic could also be added below this for storage.

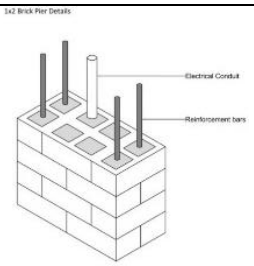
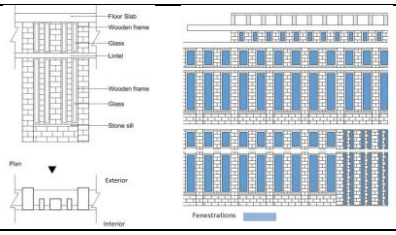
Case studies

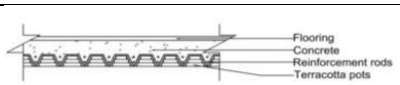
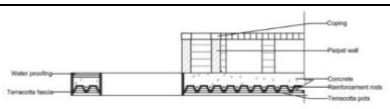
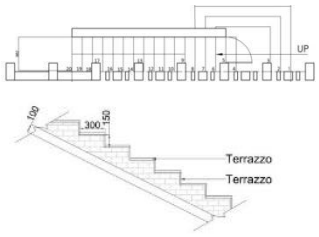
Case study -1 Mr. Suryakant Patel's Residence, Surat, Gujarat

The old city area of Surat, Gujarat is home to Mr. Suryakant Patel's abode. The house's plot and geometry are both rectangular. Nari Gandhi originally constructed this home for an actor, but Mr. Suryakant Patel eventually acquired it. All of its structural components, including the wire-cut hollow bricks, are made of specifically designed terracotta pots. The bricks are bought from the Billimora industrial region and are reinforced with steel. The use of terracotta and wire-cut brick in construction system makes it appropriate for analyzing neo-Vernacular architecture. The elements used in construction method are mentioned (briefly explained) in tabular manner in table 1.

Fig. 6: Exterior view of Mr. Suryakant Patel's residency
Source: Author

Table 1: Case study Documentation
Source: Author

Elements	Drawing	Photographic Documentation (Source: Author)
Wall		
Opening		

Floor		
Roof		
Stair		

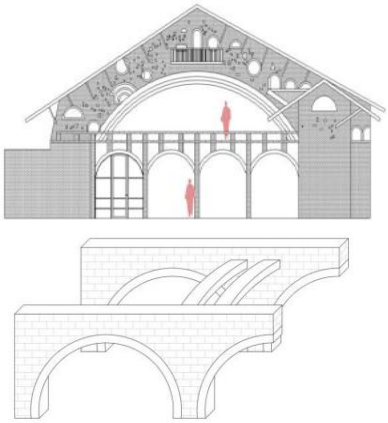
Case study 2: Rustom Mehta's Korlai Bungalow, Alibaug, Maharashtra

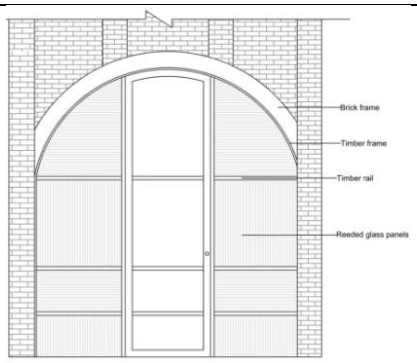
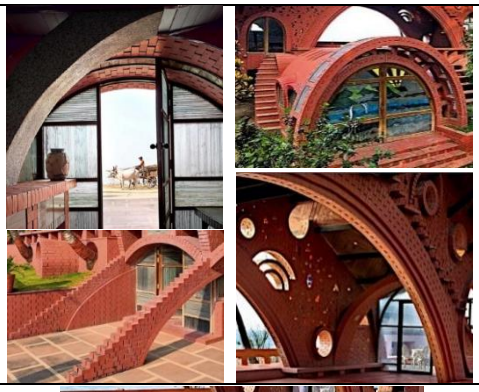
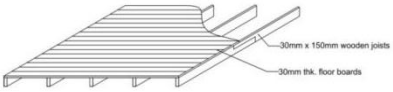
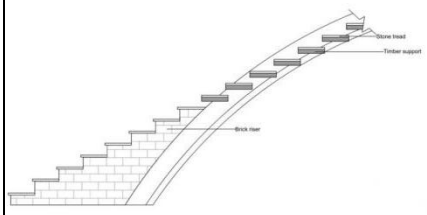
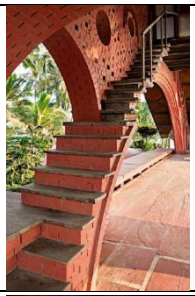
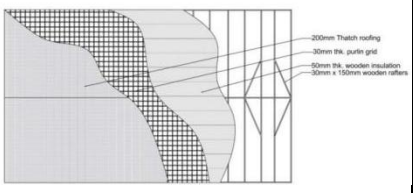
The Rustom Mehta's adobe is located in front of the Korlai beach is this sea facing residence. Probably one of Nari Gandhi's most well-known creations, this house is located in the coastal village of Korlai, south of Revdanda. It features a huge pitched roof, arched openings, and a preponderance of red bricks. The residence was built as a pavilion to the sea. Large span arches open towards the sea not just providing views to the water but also making it respond better to the chaotic currents generated over these waters during monsoon. With two massive arches supporting up the pitched roof, the area is intended to be semi-open, giving it a magnificent feel and functioning as the design's central focus point.

Fig. 7: Exterior view of Mr. Rustom Mehta's Korlai bungalow
Source: Author

The elements used in construction method are mentioned (briefly explained) in tabular manner in table 2.

Table 2: Case study Documentation
Source: Author

Elements	**Documentation**	
Walls		 

Openings		
Floor		
Stair		
Roof		 

Analysis

Table 3: Suryakant Patel's residence (Neo-Vernacular Typology) and Surat's Pol House (Vernacular Typology)
Source: Author

	Vernacular (Pol house of Surat)		Neo-Vernacular (Suryakant Patel's residency)		Observations
Element	**System**	**Material and order**	**System**	**Material and order**	
Roof	Assembly of wooden members to achieve sloping roof Extended overhangs of roof	Wooden Ridge, rafters, battens and Mangalore tiles or GI sheets with J-bolts	monolithic slab and introduction of pergola	Reinforced Cement Concrete over terracotta pots (concept of filler slab)	• Sloping roof vernacular style was modified to flat terraces in neo vernacular style. • The roof materials along with construction system have changed. • Both have extended version of shading devise

	supported with brackets				to cater climatic respose of region. • Reinforcement bars and terracotta pots introduced into the slab system.
Walls	Plastered Confined masonry structure	Assembly of wooden post with sill and lintel bands to confine brick masonry with Lime plaster or Paint Individual wooden posts with stone base	load bearing masonry structure with wire cut hollow brick module to cater vertical services	Exposed load bearing brick Wall masonry with Flemish Brick bond Lintel bands of Reinforced Cement Concrete Brick piers	• The major material for construction is brick. • Wooden lintel and columns with decorated brackets are not continued in the neo-vernacular case study. • The neo-vernacular residence observes brick walls with steel reinforcements. • In neo-vernacular residence lintel bands run through the wall.
floors	Floor boards over girder and joists assembly resting on wall plate	Indian Patent Stone or Kota stone finish over wooden floor boards. Assembly of wooden joists resting on wall plate. Long span needs Wooden girder /beam as intermediate structural member.	monolithic slab with Floor finish	Kota stone pieces with in-situ terrazzo as finishing material on top of filler slab having inverted terrcotta pots and reinforcement bars	• Floor system changed from wooden assembly to monolithic concrete slab. • Reinforcement bars introduced with inverted Terracotta pots into the filler slab system. • Kota stone as flooring material is continued but with different style of finishing. Vernacular had rough finish while neo vernacular had used kota as in situ terrazzo flooring.
openings	Vertical Three-part Window system with top hung ventilator and side hung double shutter in middle and bottom portion Side hung or pivoted double shutter door with threshold and wooden frame	Wooden frame with glass and/or wooden paneled shutter for windows Wooden frame with wooden paneled shutter rich with motif influenced from local culture for doors	Vertical two-part window system one above lintel and one below it. Open-able single shutter door with wooden frame.	Wooden frame on opening with stone sill and RCC lintel having Terracotta-fascia, Shutters having glass panel and wooden frame for windows. Wooden frame and shutter with glass panel and wooden frame for doors	• Three-part window system of vernacular is modified in Neo vernacular with two-part window opening • Construction of openings in both the residences happens with wooden frame and glass. • In the neo-vernacular residence, wood and glass has been combined to create semi-opaque doors.

Stairs	Series of tread and riser caged in wooden stringer beam system	Wood stringer beam resting on wooden girder/beam with wooden riser, tread and railing details.	Waist slab RCC staircase with terrazzo finish on tread and riser	Use of brick tile to match brick masonry supporting waist slab of Staircase tread with terrazzo finish	• Traditional wooden staircase construction methods of the pol are lost in the neo-vernacular typology.

Table 4: Korlai Bungalow (Neo-Vernacular Typology) and Revdanda House (Vernacular Typology)
Source: Author

	Vernacular		Neo-Vernacular		Material/ Order similarities
Element	**System**	**Material and order**	**System**	**Material and order**	**Observations made between the two styles**
Roof	Assembly of wooden members to achieve sloping roof Extended overhangs of roof supported with brackets	Wooden Ridge, rafters, battens and Mangalore tiles with decorative wooden eave boards as ornamental details	Assembly of steel roof resembling wooden members to achieve sloping roof Extended overhangs of roof supported with brackets	Steel truss with Mangalore tiles and bottom surface of wooden boards. decorative wooden eave as ornamental details.	• Modern technology lets the neo-vernacular roof take on larger span. • The basic structuring system of the roof remains the same, however, the materials used for the system differs
walls	Load bearing masonry structure	Laterite or thick brick walls with lime plaster On both sides	Load bearing masonry structure	Wire-cut Brick with Flemish bond, arches and brick jali as main characteristic of vertical surfaces	• The load bearing structure of the wall is continued in the neo-vernacular residence. • Arches and buttresses help transfer loads from roof to the ground in the neo-vernacular residence.
Floors	Floor boards over joists and girder assembly resting on wall plate	Wooden floor boards on assembly of wooden structure	Modular slabs over structural arches or vaults	stone slabs on assembly of brick vaults and brick arch support	• The basic structural system of the floor are similar to transfer the load however the material are different in both cases. • In the vernacular residence, wooden joist and girder help transfer load while vaults/ arches transfer the load from horizontal slab to vertical wall in the neo-vernacular residence.

Openings	Regular window openings with wooden frames and side hang paneled shutters Side hung double shutter door and wooden frame	Wooden frame with wooden paneled shutter for windows Wooden frame with wooden paneled shutter	Variety of openings in form of punctures and arches to create porosity in response to beach location	No infill used in most of the openings on the first floor Wooden frames in windows with tempered glass panel and wooden frame in shutter. Wooden frames in doors with tempered glass panel and wooden frame in shutter.	• The basic components of both the residences remain the same. • The neo-vernacular residence sees more of organic voids in the walls. • The use of tempered glass has been enhanced in neo vernacular residence. • Prominent usage of brick arch member in neo vernacular then the straight wooden element of lintel used in vernacular type
stair	Series of tread and riser caged in wooden stringer beam system	Wood stringer beam resting on wooden girder/beam with wooden riser, tread and railing details.	Composite system of staircase, partially load bearing and partially cantilevered	brick arch with tread riser masonry finished with stone slab forms partial stair while cantilevered stone slabs from masonry walls forms the other half of stair	• While staircase in vernacular residence is purely wooden, the neo-vernacular residence observes it in different manner by. maximizing the use of stone and brick masonry.

Findings and the Discussion

Restoring the lost relationship between architecture and its surroundings requires an understanding of the history of neo-vernacular architecture as well as its relevance in the contemporary day.

For both case studies, the analysis-based results are displayed in table 4. Through case studies, we are able to categories neo vernacular architecture based on its consistency, transformation, and novel concepts. It also discusses the broken connections in the vernacular type of building system.

Table 5: Interpretations derived from the case study analysis
Source: Author

Phenomena	Case Study 1 (Suryakant Patel's house)	Case Study 2 (Korlai Bungalow)
Consistent	• Extended roofing as climatic response • Brick is still continued as the major constructional material. • Load transfer system of slab-beam-column (frame system)	• Sloping roof and extended overhangs continued with varied material • Brick is still continued as the major constructional material.

	• Construction of openings with wooden frame and glass.	• Load bearing wall is continued as construction method.
Transformed	• Purpose made wire cut hollow bricks manufactured in industry for residence • Brick walls have steel reinforcements instead of confined masonry. • Wooden facia replaced with terracotta tile • Wooden lintel bands run through the wall replaced with RCC • Independent wooden posts replaced with brick piers • Three-part window changed to two-part window having ventilator at top as consistent expression	• Masonry attic space replaced by lesser width wooden attic space. • Due to the language of the residence's design, the openings are all circular and organic. • Straight beams, lintel and sill bands replaced with arches, vaults and buttresses
Novel	• Reinforcement bars introduced into the filler slab system and hollow wall system • Terrazzo for flooring, tread, riser and waterproofing. • Customized Terracotta pots acting as stay-in place formwork for the filler slab and hence is the part of the structural system. • Combining wood and glass to create semi-opaque doors. • Fixed glass vertical slit windows expression gave new language to facade	• Masonry arch spanning 9m features the major characteristic of the building. • Modular stone slabs over arches and vaults making floor system as unique language • Use of tempered glass in openings to enhance privacy but invite natural light. • Composite system of staircase, partially load bearing and partially cantilevered stones from wall
Lost	• Wooden roof and floor system has been lost through this process. • Traditional wooden staircase construction methods replaced with new material • Wooden lintel and columns with decorated brackets. • Plaster as finishing material replaced with exposed brick work and pointing.	• Wooden roof and floor system has been lost through this process. • Plaster as finishing material replaced with exposed brick work and pointing. • Traditional wooden staircase construction methods replaced with new material • Traditional vernacular doors and windows made from wood with delicate ornamentations.

The above research goes through a series of analysis where an observation of the constructional elements leads to its comparison with their vernacular counter parts and this is further funneled to obtain our final set of inference which leads this research to a set of conclusions that can help build neo-vernacular spaces with the essence of vernacular past.

Through the above table one can identify that on the path of restoring the past to the present, it is important to not lose the sense of material. As every region's vernacular architecture has been built on its sense of material availability and its resilience with the regional climate and sometimes, its association with the regional culture.

Another interesting point to be noticed in both the vernacular and neo-vernacular case studies is that the visual language of architecture correlates to the basic structural language. This visibility of structure can be further connected to its effects on the human psychology, where it builds on the sense of safety when the structure is visible to the resident's day to day lives.

Intricate stonework, ornamented wooden brackets, and many other such practices in the vernacular architecture let the material express more than its structural abilities. Imitating such elements blindly with modern materials, not just shows our lack of understanding the material, but further curbs the chance to create similar explorations with newer materials. While the essence of traditional material expression, be it the ornamented wooden staircase or the brackets have been lost, the case studies still spark the importance of material expression

through the different ways a material is used within the neo-vernacular residence. For example, Nari Gandhi uses different kinds of glass in Mr. Suryakant Patel's residence: clear glass, reeded glass, colored glass. The directions in which the reeds run is also random across the residence.

One can find Nari Gandhi beautifully highlighting the presence of the arch in Korlai bungalow by creating three bands of arches with the third band breaking the general notion of brick bonding created by the other two bands. Such explorations not only create a sense of dynamism in the space but also cater to the various senses of an individual, be it the sight or the touch.

Neo-vernacular was derived with the aim to revive the traditional essence to the modern design. Therefore, it becomes important that as an architect looks into bringing back the old methods into his designs, it must not become a hindrance to the positive aspects of modern construction technology like the larger spans, more open layouts or stronger yet less thick (lighter, at times) structural systems.

Nari Gandhi, as we can clearly see through the selected case studies, tried to make strong explorations through each of his designs. In Mr. Suryakant Patel's residence he tries reinforced brick walls and filler slabs, while in the second case study of Korlai bungalow, he builds arches almost 9m wide.

Thus, in the case studies one can find that each element is given as much significance as the whole residence. Each part builds up to become the whole, a process similar to the native construction culture, where special attention was given to the process by the mason which led to a creation, which was not only holistic but also progressive for the community.

Conclusion

This research elucidates the significance of neo-vernacular architecture in contemporary design, particularly concerning the construction methods employed by the architect Nari Gandhi. Neo-vernacular architecture seeks to reconnect traditional building practices with modern requirements, promoting a harmonious blend of local heritage and contemporary sensibilities.

Four key ideas emerge from the analysis of Gandhi's work regarding how construction methods might incorporate contemporary innovations while preserving traditional values.

1. Key idea 1: Crafting Continuity
   New materials and methods can be explored; however, the modern design should not take away or replace the traditional material palette existing in the context's vernacular language.

2. Key idea 2: Celebrating the Structure
   Further, the design should let the material stay true to its nature. What is of importance is that structural system becomes the generator of the visible architectural language and not the visual aesthetic façade.
3. Key idea 3: Freedom of Expression
   There is a noted exploration with creating an expression through the material. Exploring the potential of bricks in both the cases yet giving the context specific language is commendable experience. Many such material explorations can be seen vividly in Nari Gandhi's designs, use of different types of glass panels: reeded glass, glass mosaic in Mr. Suryakant Patel's residence and Korlai Bungalow, all contribute in adding dynamism to the space which otherwise is absent in the finished looks of the modern houses.
4. Key idea 4: A Step towards Modern
   Neo-vernacular was derived with the aim to revive the traditional essence to the modern design. Therefore, it becomes important that as an architect looks into bringing back the old methods into his designs, it must not become a hindrance to the positive aspects of modern construction technology

Furthermore, the study emphasizes that neo-vernacular architecture goes beyond simply copying old architectural styles. Rather, the process entails analyzing and transforming conventional components to produce useful frameworks that are in line with modern needs. Architects are able to create rooms that are both aesthetically pleasing and sensible from a practical standpoint when they combine traditional aesthetics with current logic. The case study that was selected clearly examined the building techniques, citing the neo vernacular as a preferred approach to design development. In all instances, Nari Gandhi has maintained the local vernacular expression while incorporating the subtleties of technology into the structure, as the findings discuss.

Additionally, while preserving the essence of vernacular architecture is crucial, neo-vernacular architecture equally allows for the incorporation of advanced materials and construction technologies. This duality grants architects the flexibility to address modern spatial requirements without compromising the integrity of local traditions.

In conclusion, the study of neo-vernacular architecture through the lens of Nari Gandhi's work provides valuable insights into the potential of integrating traditional and contemporary elements. Future research could investigate the interplay of space and culture in enriching the dialogue between historical and contemporary architecture, ultimately fostering designs that continue to honor our architectural heritage while embracing the future.

References

Bahga, S. S. (2024) Echoes of Genius:A Tribute to Nari Gandhi's Architectural Legacy. [Online]
Available at: https://bahga-sarbjit.medium.com/echoes-of-genius-612508d0c681
[Accessed 22 september 2024].

Choksi, J. (2008) *A study of House form and settlement pattern at Vadnagar,* Ahmedabad: Unpublished Thesis.

Coreea, C. (2017) Housing, in: *Shelter.* Bombay: Sage,

Deplazes, A. (2005) *Constructing Architecture -Materials, Processes, Structures.* Basel: Birkhäuser Basel.

Desai, M. D. A. M. (2016) *The Bungalow in Twentieth-Century India: The Cultural Expression of Changing Ways of Life and Aspirations in the Domestic Architecture of Colonial and Post-Colonial Society.* s.l.: Routledge.

Desai, M. & Desai, M. (2012) *Architectural heritage of Gujarat.* Ahmedabad: Government of Gujarat.

Dongre, N. L. (2016) Analysing Social Relevance of Spatial Organisation: A Case Study of Traditional Pol Houses, Ahmedabad, India. *Asian Social Science,* 12(9), 108-134

Dongre, N. R. L. N. A. A. R. (2019) A shape grammar approach to contextual design: A case study of the Pol houses of Ahmedabad, India. *Environment and Planning B: Urban Analytics and City Science,* pp. 46(5):845-861.

Fathy, H. (1986) Vernacular Architecture. Chicago: The University of Chicago Press.

Gajjar, V. & Bhavasar, F. (2019) Ambiance through Spatial Organization in Vernacular architecture of hot & dry region of India - The case of Ahmedabad and Jodhpur. Nants, edp Science.

Gajjar, V., Bhavsar, F. & Vora, H. (2022) *Socio-Cultural Determinants Shaping the Nagar Community Dwelling- Case Study of Patan.* Bhopal, SPA Bhopal and Copal Publishing.

Gore, R. & Chhaya, N. H. (1996) *Work of Nari Gandhi.* Ahmedabad (Gujarat): CEPT University.

Jalia, A. A. (2008) *Refiguring the Sketch: The Nari Gandhi Cartographic,* s.l.: s.n.

Jencks, C. A. (1984) The Language of Post-Modern Architecture. s.l. : Academy Editions.

Kirbas, B. H. (2015) Learning from Vernacular Architecture: Ecological Solutions in Traditional Erzurum Houses, Turkey. Retrieved from. 14 october, pp. 788-799.

Lang, J. T. (2002) A Concise History of Modern Architecture in India. Delhi: Permanent Black.

Majmundar, N. (2018) *Wehla uthjo.* Ahmedabad: Nagar Samaj Patrika.
Malhotra, M. B. A. M. (2011) *At the Core: Understanding the built heritage of Surat and Rander,* Surat: Urban Management Centre (UMC) .
Mehta, M. (1922) *Nagar Utpatti.* 1st ed. s.l.:Nagar Samaj.
Mondal, R. (2019) *Zingy Homes.* [Online]
Available at: https://www.zingyhomes.com/latest-trends/architecture-and-culture-relation-influence/
[Accessed 19 Decemebr 2020].
Motealleh, P. Z. M. P. M. (2016) *Investigative climate responsive solutions in vernacular architecture of Bushehr City.* [Online]
Available at: https://doi.org/10.1016/j.hbrcj.2016.08.001
[Accessed 28 December 2020].
Nasution, I. N. (2012) *Analysis of The Causes of The Shape Differences in Vernacular Building, Case Study: Bagas Godang in Mandailing Godang and Mandailing Julu, North Sumatra-Indonesia.* Famagusta, North Cyprus, Eastern Mediterranean University Press.
Oliver, P. (2006) *Built to meet needs.* Burlington MA: Routledge.
P. M. (2010) Regionalism and Revivalism in Neo Vernacular architecture of India. *architecture+ design. A Journal of Indian Architecture,* 27(4), 57-62.
Pandya, Y. (2005) *Concepts of Space in Traditional Indian Architecture.* Ahmedabad: Mapin
Raje, U. D. A. N. (2000) Universal and the Contextual: influence of Frank Lloyd wright on contemporary Indian architecture. Ahmedabad: CEPT University.
Ramakrishnan, P. (2016) *Socio cultural pattern and spatial organisation in a traditional dwelling in Kerala,* s.l.: s.n.
Rapoport, A. (1969) House Form and Culture. s.l.:s.n.
Reed, B. (2006) Shifting from'sustainability' to regeneration. *Integrative Design Collaborative and Regenesis.*
Reed, P. M. A. B. (2012) Regenerative Development and Design. January, 3-35.
Ritu Gulati, V. S. J. Q. S. R. (2019) Architectural Spaces as Socio-Cultural Connectors: Lessons from the Vernacular Houses of Lucknow, India. *ISVS e-journal,* 6(4), 19.
Rudofsky, B. (1965) *Architecture without Architects.* New York: Connecticut Printers, Inc., Hartford, Connecticut.
Sanyam Bahga, G. R. (2020) Complexities of practicing architectural regionalism in India: An interview study. *Frontiers of Architectural Research,* 9(3),568-578.
Shukla, P. (2014) *A Study of Houses of Nagar Brahmins in walled city of Ahmedabad with reference to their socio-cultural Background,* s.l.: s.n.
Srivastava, A. & Das, B. K. (2023) Vernacular Architecture of India: An Overview. *ISVS e-journal,* 10(7), 435-448.
Stephen, K. (1994) Cultural influence on architecture.
Taj, H. M. (2009) *Nari Gandhi.* s.l.:Foundation For architecture.
Turkušić, E. (2010) *Neo-vernacular architecture is an extension of previous techniques for comprehending structures, areas, and human requirements..* Sarajevo, Importance of Place - 4th International Conference on Hazards and Modern Heritage.
Umraniya, S. & Menghani, J. (2022) *Evolving Morpho-typology:use of prefebrication in spontaneous vernacular urban habitats of coastal Saurashtra.* bhopal, SPA and Copal publishing.
Wells, C. (1982) *Perspective in vernacular architecture.* s.l.:Univ of Missouri Pr; First Edition.
Widiastuti, I. (2013) The Living Culture and Typo-Morphology of Vernacular Houses in Kerala. *ISVS e-journal,* 2(4),13.
Willi Weber, S. Y. (2013) *Learning from vernacular Architecture.* s.l.:s.n.
Zari Maibritt Pedersen, S. J. (2009) Rethinking our built environments: Towards a sustainable future.