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HOUSING

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EDITOR'S NOTE

Good is not good when better is expected.
VIN SCULLY

The June issue is dedicated to 'Hospitality'.

Quite a number of architects are engaged in the design of buildings in the hospitality industry. The hospitality industry may be broken down into three basic domains: accommodation, food and beverage and travel and tourism.

Hospitality architecture and design have evolved over time with many transformations with the intent to provide the best experience to customers and visitors. Responsible attitudes and eco-tourism are also approaches that need more recognition.

In Dialogue, we see Ar Bijoy Ramachandran in conversation with renowned architects on Architecture and the City.

Achievement
As per the UGC Draft Regulations for Minimum Standards and Procedures for Award of Ph.D. Degree (Clause 9.3), research papers published in 'refereed / peer-reviewed' journals are acceptable. JIIA being a refereed / peer-reviewed journal, I am delighted to share with you that our Journal will now be able to stand acceptable and recognised for publishing by researchers for their academic papers in JIIA and may use the same for the relevant purpose.
Congratulations IIA and Team JIIA.

We continue with our regular features that include Sketches, Young Practice, Photo Essay and a lot more. Keep reading and keep contributing to JIIA.

Ar. Lalichan Zacharias
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PRESIDENT'S MESSAGE

Dear Members,

Greetings!

It is heartening to know that architectural practices, especially youngsters, have been working from smaller cities and towns across the country thereby reaching out to a majority of the population with their services. Some of them have been doing innovative works and that really spreads awareness of architecture which can be beneficial to all.

There are a considerable number of architects in the small cities and towns and we have to reach out them to be part of the Institute. The Chapters and Centres can identify such areas and work towards formation of new Centres and Sub-Centres to give them a platform for coming together for sharing and expanding their knowledge and fellowship. External extension of membership is a key area to expand the reach of our Institute and its programs.

The online building approval process is in vogue in most parts of the country. But still hassles remain. Such issues should be constantly brought to the notice of the concerned by our Chapters and Centres.

The IIA Karnataka Chapter has recently launched a mobile app for its members. The efforts by the team to connect and provide professional and essential information to the members is appreciable.

The IIA Regional Conferences are being revived after some considerable time. The Central, Northern and Southern Regional conferences are being held in July, September and November and hosted by Madhya Pradesh, Northern Chapter & Karnataka Chapter respectively. These will give architects from the region more opportunities to present, discuss on topics of interest apart from the synergy in team building and an opportunity to involve more members in developing organizational and leadership skills.

Let us all participate and contribute to the growth of our Institute and its reach.

Best Wishes

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THEME

HOSPITALITY

Much about our current reality is different than it used to be, including how we travel. COVID-19, coupled with a global economic slowdown, is changing people's priorities. Today's travellers want to maximize their experiences while minimizing risk, and this is driving the hospitality industry to design new types of spaces.

They're looking for increased connections to the outdoors — from outdoor amenities and dining to public spaces. And cleanliness is a top priority.

The hospitality industry is grappling with a raft of new expectations and customer behaviours, and many are asking how these will impact design and the role of the hotel.

How pandemics have shaped the built environment
Historically, the symbiotic relationship between cities, architecture, and epidemics has always been complicated; diseases have prompted our cities to morph and progress. The cholera epidemic in the 19th century spurred urban design interventions such as wide boulevards, expansive public parks, and standardized citywide sewage systems. Similarly, the tuberculosis epidemic in the late 19th and early 20th centuries prompted the design of sanatoriums, which later influenced Modernist architecture.

Today's reality isn't far from these historical examples. COVID-19 has accelerated the need for a morphological change, which inevitably affects the spaces we inhabit. The Hospitality industry is among the most affected segments impacted by this pandemic.

Here are six hospitality trends that will shape the future of the industry:

Flexible use of spaces:
Flexibility and adaptability are key considerations in hotel design. In the immediate term, hotels are being reinvented for "emergency design" interventions, by transforming spaces for medical use and isolation shelter amid COVID-19. Other spaces within hotels, such as lobbies and amenities, should be transformable to accommodate any future threat. Public bathrooms, for example, could be used as "wellness rooms" with showers, nursing areas, cleaning areas, and more.

Smart use of materials:
Simple design promotes the reset of a new aesthetic of cleanliness. Features such as hard flooring, simple bedding materials, easily-cleanable bathrooms, anti-bacterial materials, seamless surfaces, and limited furniture pieces can be designed elegantly, yet still be easy to maintain. Another way material can be used as a tool to avoid spread of virus is as textural or colour demarcation between areas.

Wellness:
COVID-19 has accelerated the in-room fitness trend. The standardization of wellness options in standard guestrooms allows guests to continue their routines while traveling, thereby minimizing risk. The integration of wellness and health technology can also be a great differentiator. Hotel operators can offer personalized well-being packages for guests in the comfort of their room by offering in-room exercise equipment, health-tech apps and devices, and bespoke content programming.

Open vs. closed:
Designing to promote social distancing could make spaces more hospitable: hotels should provide flexibility and agility, but also compartmentalization of space as needed. Breakout spaces away from high-traffic areas can minimize guest-to-guest interaction, and having a variety of spaces with different air circulation will lessen occupancy in shared communal spaces. Private rooftops, terraces, and operable walls and windows can improve ventilation and provide a safe outdoor experience.

Rethink circulation:
Circulation is a key intervention to combat the spread of the virus. Hotels should implement a one-way circulation system to minimize occupancy and direct the flow of people in a single direction to minimize risk.

Seamless technology:
Integrating smart technologies into the guest experience will help ameliorate guests' fear of the risk of contagion. Think of touch-less check-in points, digital concierge service, touch-less guestroom locks, motion-activated doors, voice control commands, virtual access to medical staff, self-cleaning bathrooms, etc.

While pandemics have brought hardship to our daily lives, they've also shaped our cities by forcing architecture and urban planning to evolve and innovate. The recent pandemic is a stark reminder of the need for resilient design that can adapt and weather unforeseen crises. Hotel design should mediate between the perceived needs of current situations and the uncertain needs of the future.

Ar. Tushar Sogani

RESEARCH

Role of Traditional Knowledge System in Building Resilient Built Environment: A Study of Garhwal Region, Uttarakhand
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●

Transformation of Urban Streetscape Case of Malleshwaram, Bengaluru
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Rajesh Malik

ROLE OF TRADITIONAL KNOWLEDGE SYSTEM IN BUILDING RESILIENT BUILT ENVIRONMENT: A STUDY OF GARHWAL REGION, UTTARAKHAND

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ABSTRACT

Traditional knowledge systems have evolved from the experiences of communities. They have the mechanism to cater socially and are ecologically responsive and disaster-resilient lifestyles. In mountain ecosystems like Garhwal in Uttarakhand, the natural setting is extreme, livelihood resources are minimal, and are threatened by constant disasters. In such cases, the traditional knowledge system is the key to better living. Hence, it is observed that communities are continuing to practice their traditional wisdom of livelihood, natural resources, health, buildings, and construction. This system contributes to an essential relevance in building resilient communities. The aim is to study and document the traditional knowledge system for Uttarakhand state in the Garhwal region in order to develop an understanding of the various systems and evolve mechanisms to benefit the community. This research allows us to understand that traditions and culture significantly impact lifestyle and built form. The study assesses the geographic profile as well as the socio-economic and built environment study. This study provides awareness of the indigenous community's life and its intangible and tangible heritage. It invites further exploration of the Garhwal culture and its valuable traditional knowledge system.

Keywords: *traditional knowledge system, disaster resilience, socio-economic built environment, sustainability.*

1. Introduction

Uttarakhand is one of the hilly states in the Himalayan belt. It lies in the northern part of India between the latitudes 28˚43' N and 31˚27' N and longitudes 77˚34' E and 81˚02' N **(Govt. of Uttarakhand, 2014).** It is a state with 13 hill districts with two major divisions- Garhwal and Kumaon, based on their cultural differences and historical background. The cultural background of the Garhwal region is more spiritual due to ancient Hindu temples and the holy river Ganga. (ibid). Geographically, the Garhwal region is more fragile, disaster-prone, and sensitive. Moreover, it has extreme weather conditions and dense forests. To cope with these extreme conditions, communities follow traditional practices. The hill state offers unbelievable vignettes in the fields of architecture, water management, ethnomedicine, ethnobotany, metallurgy and agriculture. They show a deep understanding of climate change and risk reduction at the building level and the community level. The communities have transferred knowledge and wisdom from one generation to another through oral and other traditional ways. These practices protect the built environment, maintain the community's social fabric and minimize hazards cost-effectively and sustainably. Today, numerous multi-storied buildings are constructed without considering the geography and climate with modern materials and techniques which damage the fragile environment in and around the hilly settlements and affect social and physical well-being. Traditional practices are beneficial even today and therefore need to be studied and documented.

Methodology

The study was initiated from macro-level planning and gradually moved on to micro-level planning. Macro-level planning includes the process of selecting the site and developing and arranging the built form which will respond to the natural landscape. Micro-level planning includes the selection of materials, disaster resilience, climatic response, structural stability, aesthetical value and use of small spaces for different purposes. This study has been done based on the secondary sources including DMMC reports, research papers and government reports.

2. TRADITIONAL KNOWLEDGE SYSTEMS ABOUT BUILT ENVIRONMENT

2.2 Evolution of Settlement

Uttarakhand has a rich past in architecture. Communities developed their style of architecture using locally available materials. Both Garhwal and Kumaon regions have their own set of traditional wisdom of building construction. The following study covers the evolution, types of settlement and different techniques and the style used in the Garhwal region for construction. The initial settlements came in the higher region of Uttarkashi valley due to the old Indo-Tibetan route (refer Fig. 1). The communities believe that majority of the settlements were not permanent. Nomads used to stay near the forest areas and the availability of water, fodder, and possibilities of agriculture practices were the criteria for site selection. Many temporary settlements turned permanent slowly as the communities started inviting their friends and relatives. These settlements are passed onto generations by oral traditions in the villages during festivals through folktales and folksongs (Routela, 2015).

2.2 Types of Settlements

Due to the difference in geography, different types of settlements have evolved depending upon the location. These settlements can be categorized into four types- valley, hill-top, spur and gap. Local communities have developed their response toward site planning according to the existing conditions. Table no. 1 describes the design techniques that can be used to construct in sloped terrain. Tables 2 and 3 show the site planning approaches and features for every type of settlement respectively (Rawat, 2019).

Figure 1: Evolution of settlements
(Source: Author)

3. Styles of Architecture in the Garhwal region

3.1 An Overview

The Garhwal and the Kumaon regions have different local languages, cultures and traditions. Due to these, the building styles have also evolved independently in both regions. Kumaon region comprises the districts of Chamoli, Dehradun, Haridwar, Pauri Garhwal, Rudraprayag, Tehri Garhwal and Uttarkashi. The characteristic features of the traditional architecture found in this region are dictated by the immense availability of stone and timber in the areas. The walls are typically made of stone while the timber is used for structural purposes and the slates are used for roofing. The floors are made of wooden planks or mud, for insulation and occasionally stone slabs are also used. Whereas the Garhwal region comprises the district of Almora, Bageshwar, Champawat, Nainital, Pithoragarh and Udham Singh Nagar. The houses in this region are placed after careful site selection usually en route to the pilgrim centres, near sources of water and in the areas which provide protection from the cold winds in winter. The traditional houses are built along the contours of the hills and are generally two- or three-storeyed, having a rectangular plan. It is observed that buildings in the Kumaon region are more elaborate and detailed than Garhwal architecture (Negi, Jain, & Singh, 2017). The detailed study of Garhwal region architecture is discussed in Table no 4.

3.2 Garhwali Stone Construction

According to Negi, et al (2017), the geometry of these houses rectangular and straightforward, which provides stability and makes it less disaster-prone. Thick masonry walls are made from stone and timber (refer Fig. 2). The sloping roof is constructed with locally available slate tiles. It is covered with mud plaster and placed above the timber beams. This method is also known as dry stone construction as dry masonry due to its limited water source. The dry masonry provides flexibility in horizontal movement. The interlocking between the stone is so efficient that it can prevent the wall from collapsing. Mud and cow dung is used for plastering the walls. The doors and windows are kept small to give insulation. Initially, timber was used for structural members. Today, concrete columns and beams are used in many Garhwali styles of the house due to a lack of timber availability.

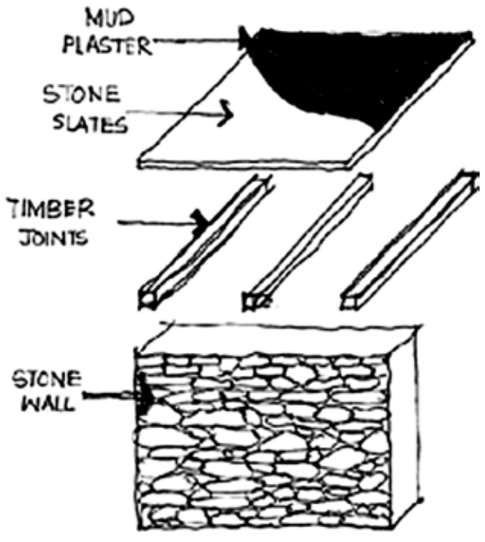


Figure 2: Construction Detail
(Source: S. K. Negi, 2017)

3.3 Koti Banal Style of Construction

Despite being a part of a seismically vulnerable region, Garhwal shows an elaborate earthquake-safe construction style called Koti Banal architecture. The local communities practice this style for the past 1000 years. Koti Banal is a village near Yamuna valley in the Uttarkashi district with its own set of building features (Rautela, Joshi, & Lang, 2008). The salient features of this technique are listed below (Joshi & Chandra, 2008):

1) Raised Platform

The buildings are constructed on a stone-filled reliable platform. Its height varies from 1.8m to 3.6m. Dry stone masonry is used for construction.

2) Simplicity

The structure is constructed on a rectangular plan with a ratio of 1:1.5 (refer Fig. 3). The length and the width vary between 4 to 8 meters. This symmetrical plan provides rigidity and minimizes the torsion. The height of the building is maintained double the length of the shorter side. Mostly it is maintained between 7 to 12 meters.

3) Walls

The thickness of the wall depends on the available size of the wooden log. The wall is constructed with dressed up flat stones and two wooden logs alternative arrangement. A wooden beam is placed in the middle height of the wall to provide better reinforcement.

4) Openings

Most of the houses have a single small entry on the ground floor above the raised platform. Access to the upper floors is provided with the help of wooden ladders. The size of the opening is small, and the height is low. Firm wooden logs are provided for the framing and to compensate for the loss of strength.

3.4 Salient structural features of Koti Banal architecture:

Some of the salient structural features of Koti Banal architecture as stated by Joshi (2008) are as follows:

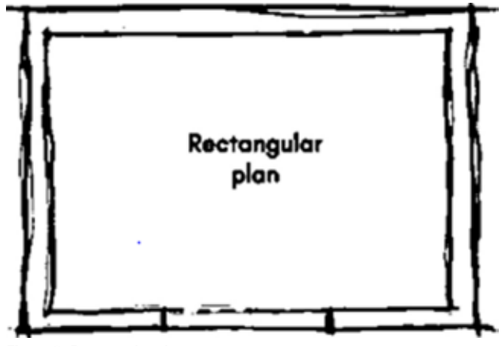


Figure 3: Rectangular plan
(Source: Author)

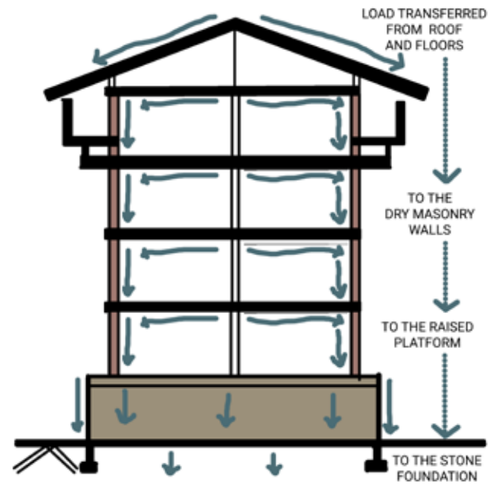


Figure 4: Load transfer mechanism
(Source: Author)

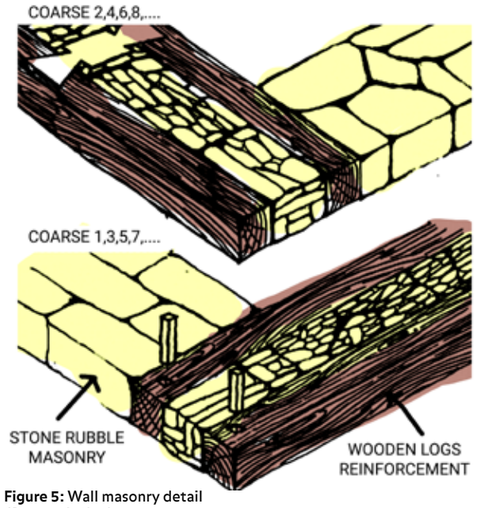


Figure 5: Wall masonry detail
(Source: Author)

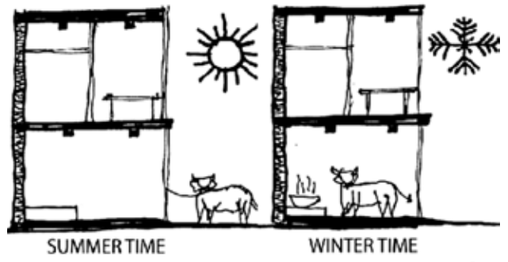


Figure 6: Different Use of ground floor in different season
(Source: Author)

- *Load Resisting System:* The masonry used for construction is dry rubble masonry. And hence it helps in lateral deflection. This avoids damages during earthquakes. The live load and dead load gets distributed from roof to wooden structural logs to the dry masonry walls, and wall transfers the load to the strong stone foundation as shown in Fig. 4.

1) Good aspect ratio (1:1.5) of building: This is in line with building code requirements, which state that the structure should have a simple rectangular plan layout and be symmetrical in terms of mass and rigidity to reduce torsion and stress accumulation.

2) Timber reinforced stone wall with dry masonry: There are two kinds of load sharing mechanisms in the 1.5 feet thick dry masonry walls: i) vertical load is distributed through walls which run in all four directions, and ii) horizontal weight is distributed via intersected timber logs in parallel and perpendicular directions (refer Fig. 5). In the construction of the wall, wooden beams can be seen coming in from the outside. These beams are installed from above which improves the structure's seismic resistance.

3) Massive solid platform: It is located at the structure's base and aids in keeping the structure's centre of gravity and centre of mass close to the ground. During earthquakes, this type of loading reduces the overturning effect of very tall structures. For higher storeys, lighter materials are used for construction.

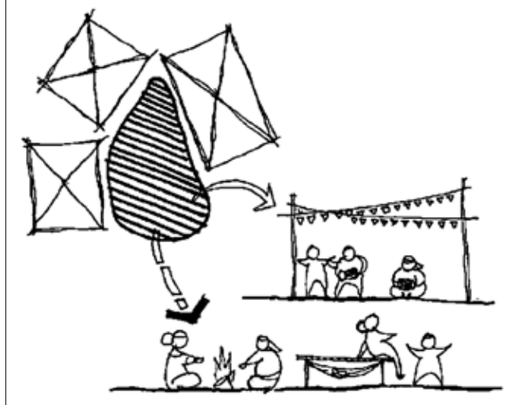


Figure 7: Use of central open space
(Source: Author)

Figure 8: Use of Semi - open space
(Source: Author)

4) Use wooden beams for structural support: The building's beams are usually rectangular and 20 to 30 cm thick. These beams have a width-to-height ratio of 2:3, making them appropriate for use as bending members. These wooden beams have sections that are larger than required for safety. As a result, the construction system satisfies both the rigidity and strength requirements. This aids shock resistance even further. Wood is an elasto-plastic substance that may absorb seismic energy. The wooden components featured in these structures are joined utilizing a combination of housing and nailing techniques. Minimal angular displacement is possible as a result of this.

3.5 Socio-Economic Aspects

Generally, one family occupies one housing unit. Due to the succession of families, nowadays, different floors are allocated for different sons. During the daytime, a maximum of five members are present in the house, and in the evening, 5 to 10 members are present. In most houses, the ground floor is used for cattle, and the upper floors are used as living and kitchen (refer Fig. 6). The use of spaces in the Garhwali houses changes as per weather conditions. On summer days, the cattle are kept outside. However, on winter days, they are kept inside the ground floor space. Usually, the ground floor is used for storage and cattle, but this space is used for cooking to keep the upper floors warm in winter times. Toilets are missing in old houses as cultural ethics do not allow building a toilet inside the house.

On the first floor of a typical Garhwali residence, a semi-open space with columns on the front and a wall on the other three sides is observed. That space traditionally acts as a semi-open front room for daytime activities. In most modern houses, that space is perceived as a balcony (refer Fig. 7).

Traditional houses have three kinds of spaces- open, semi-open and enclosed. Every space has its own set of functions. They may vary according to time and weather conditions—most of the spaces around the house are used by women for household activities. The spaces formed due to a cluster of two-three adjacent houses act as a private shared gathering space as shown in Fig. 8.

Two types of architectural styles are dominant in the Garhwal region: traditional and contemporary. The houses which are built considering indigenous wisdom are older than the modern dwellings. There are similarities and differences between these two styles. Table no. 5 shows a comparative analysis of those styles.

4. Case studies

4.1 Case study 1: Koti Banal Village

Location: Near Barkot, Uttarkashi (Area: 1.1 sq. km.)
Koti Banal village is one of the well-known villages in the district. It has no proper connectivity to the main road. The settlement is connected with different small public spaces formed organically in the checks (refer Fig.9). These public spaces act as gathering spaces for holding different festival activities (refer Fig. 10). The houses are oriented in the north direction (Fig. 11) and hence the open spaces between them get ample sunlight, and daily household activities can be done there. The wooden houses in this village are mostly 2 to 3 storeyed. The ground floor is allocated for cattle and the family occupies the upper floors (Sharma, 2020).

4.2 Case study 2: Sonara Village

Location: Rajgarhi, Uttarkashi.
Sonora is a small village with a total area of 113.7 hectares and a population of 334 people. Stone and wood, load-bearing construction is found in the village. In this typology, the ground floor is constructed using stone (refer Fig. 12), and the thickness of each wall is 500mm. For constructing the first floor, interlocking rods of wood are used with stone to make the upper structure lighter. This technique centralizes the centre of gravity and hence makes the structure earthquake-resilient. Granaries and structural members are made purely with deodar wood only. Random rubble masonry is used in the construction of the wall. This village has rocky terrain, so the houses do not require any foundation underground (refer Fig. 13). The settlement has spread organically in small pockets around the river (as shown in Fig. 14).

4.3 Case study 3: Gona Village

Location: Rajgarhi, Uttarkashi
Gona village has an area of 127.53 hectares with a population of 383. The settlement is spread inorganically around the main pathway (as shown in Fig. 15). Wood and stone are used for construction. In this village, the houses are taller to manage the mass to a small area (as shown in Fig. 16). The ground floor is locally known as goshal or goth, a space dedicated to cattle and storage. This floor has no formal or defined entrance (refer fig. 17). Ventilators are used instead of the window to provide insulation. The flooring is coated with cow dung. Sometimes, this space is also used for cooking. The construction is simple and symmetrical. Strong interlocking wooden members are joined at the corners. The structure has flexibility as it has no mortar. The thickness of the wall decreases on the upper floors. The building rises to 13m over the ground with a pitched roof (Sharma, 2020).

4.4 Case study 4: Khirsu Village

Khirsu is a small village with a population of approximately 1000, located in Pauri Garhwal district in the Garhwal region. It is placed at an altitude of 1700m. A total of 245 families live here. Farming is the primary source of livelihood. Hence the daily routine activities are either household or agriculture-related. The spaces built based on traditional knowledge are helping them to perform their daily chores. The open spaces get uniform sunlight due to the north orientation of the building. Fig.18 explains the traditional house form and activities around it (Compartment S4, 2020).

5. Conclusion

After this study, a few salient points have been observed :
1) Garhwal region has its own set of cultures, construction styles and geographic conditions. It is more disaster-prone and vulnerable as compared to Kumaon.
2) Traditional knowledge system has helped local communities to cope with adverse situations and maintain livelihoods.
3) Local communities still use the indigenous knowledge passed by their ancestors for farming, construction, site planning and medication.
4) Nowadays, people tend to choose modern materials for construction due to the lack of availability of wood.

Figure 9: Site plan of Koti-banal village
(Source: Sharma, N., 2020)

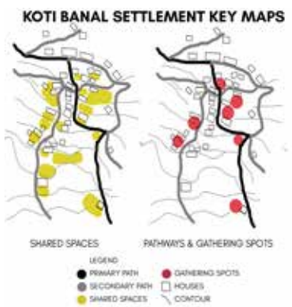


Figure 10: Movement and open space
(Source: Sharma, N., 2020)

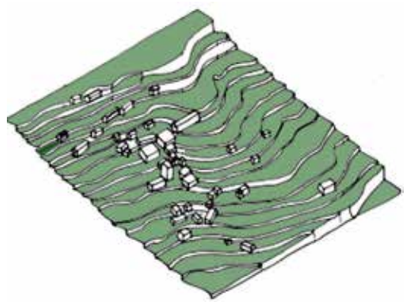


Figure 11: Site contours and settlement
(Source: Sharma, N., 2020)

Figure 12: Ground Floor plan of house
(Source: Sharma, N., 2020)

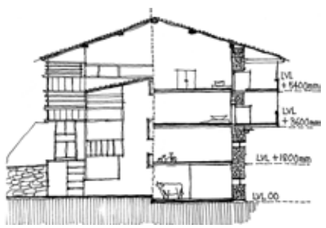


Figure 13: Site plan of Sonara Village
(Source: Sharma, N., 2020)

Figure 14: Sectional Elevation of House in Sonara village *(Source: Sharma, N., 2020)*

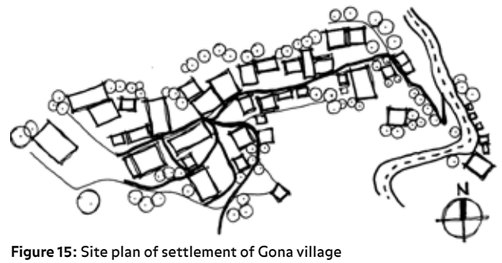


Figure 15: Site plan of settlement of Gona village
(Source: Sharma, N., 2020)

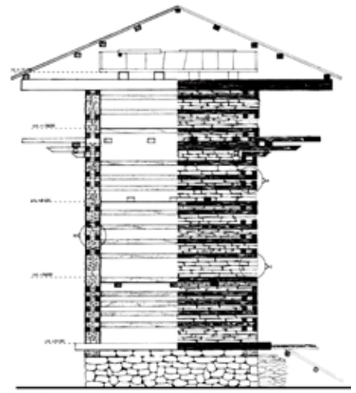


Figure 16: Section and elevation detail
(Source: Sharma, N., 2020)

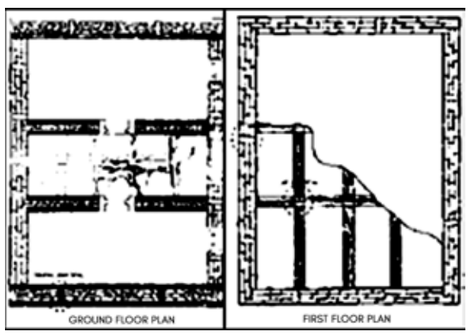


Figure 17: Ground and first floor plan of house
(Source: Sharma, N., 2020)

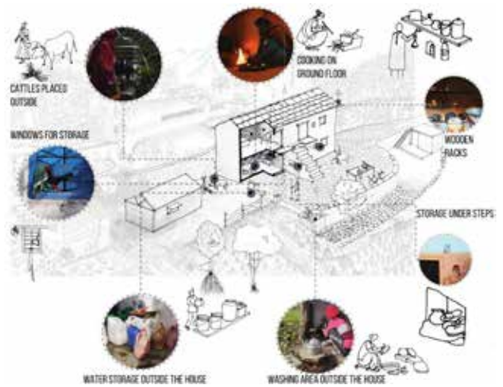


Figure 18: House form and activities around it
(Source: Compartment S4, 2020)

Table 1: **Design Guidelines for a sloping site**
(Source: Author)

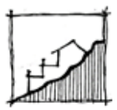
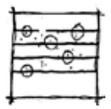
No	DOs		DO NOTs	
1	Structures should minimize the grading and preserve the natural features.		Constructing the building by destroying the natural slop and landscapes	
2	Terraced decks minimize the visual bulk		Overhanging makes building look more massive	
3	Grading angle should be gradually transitioned to the angle of the natural slope		Steeper slopes with an angular profile should be avoided	
4	Trees and shrubs in concave areas are preferred		Avoid uniform coverage of tress	
5	The most significant horizontal direction of the building parallel to the natural contour		Buildings perpendicular to the natural contour	
6	Vertical structures should be below the ridge elevation		Structures with massive form and height destroy the silhouettes of hill	
7	Gable end perpendicular to the direction of the downhill side		Gable ends of the house on the downhill side	
8	The angle of roof slope should be parallel to the slope		The angle of roof opposite in direction with a slope of contour	

Table 2: **Site planning Approach for of different settlement types**
(Source: Author)

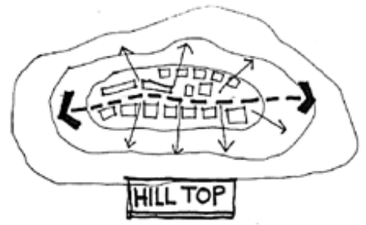
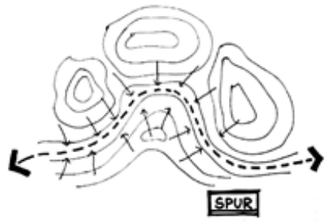
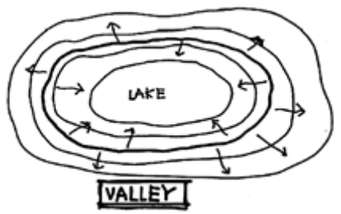
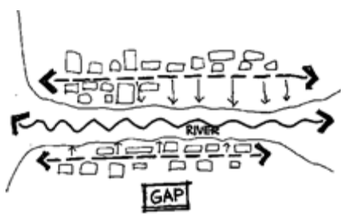
Site Type	Planning Approach	Patterns
Hill Top	They spread along the central functional axis, which is parallel to the contour and ridge. They spread from the central axis outwards	 Hill top settlement pattern
Spur	Spur settlements grow inwards. They spread towards the major axis or major road.	 Spur settlement pattern
Valley	They spread in outwards direction, from major axis towards up and down areas of the valley.	 Valley Settlement pattern
Gap	These settlement types have the least scope for spreading and are divided into 2-3 parts due to river or stream. The structures are built along the liner axis parallel to the edge of the river.	 Gap settlement pattern

Table 3: **Types of settlements**
(Source: Adapted by Author from Rawat, 2019; All images from Google earth, Nov. 2021)

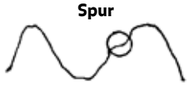
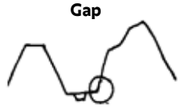
Location	Pros	Cons	
Valley 	Centrality, adequate space for physical expansion, Easy accessibility of water, Ease for transportation and utility services network	Due to the presence of a river system or water body and its catchment	 Thalisain Village in Pauri Garhwal
Hill-top 	Healthy climate, scenic beauty, Strategic position, and free drainage.	Virtual absence of flat land and lack of water supply	 Narendra Nagar in Tehri Garhwal
Spur 	Transition between valley floors and hilltops, Natural defense, panoramic landscapes, moderate climate, and limited loss to the agricultural fields	Restricted accessibility, frequent landslides, and limited scope for expansion	 Pauri town in Pauri Garhwal
Gap 	Coverage of routes, transition points, water availability	limited scope for expansion	 Devaprayag in Tehri Garhwal

Table 4: **Common Characteristics of Traditional Housing**
(Source: Author)

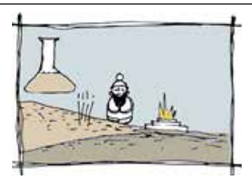
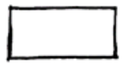
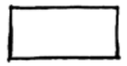
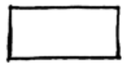
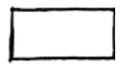
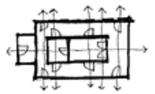
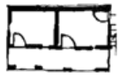
1. Soil Testing: The first step in construction is soil testing in the Garhwal region. The locals examine the soil land and then consult the priest regarding the site's good or bad aspects.	
2. Small Doors and Windows: Old houses have some characteristics which protect them from extreme weather conditions. Most of the houses in the Garhwal region have only one or two small windows.	
3. Extensive use of timber: Timber is found in abundance. Villagers believe that wooden houses are best suited according to the geographical conditions of this place	

Table 5: **Comparative analysis of Traditional and modern villages in Uttarkashi district**
(Source:Adapted by Author from Rawat, 2019)

Aspect	Traditional Architecture		Contemporary Architecture		Inference
House	Panwar Residence in Uttarkashi (1700s)	Residence in Mussoorie (1810)	Pant Residence in Uttarkashi (1998)	Residence in Tilod, Uttarkashi (1995)	
Site *(Image source: Author)*					Traditional houses have stable sites
Plan *(Image source: Author)*					The geometry in traditional is symmetrical and simple in both cases
Projections *(Image source: Author)*					More robust joinery in traditional houses and more articulated.
Openings *(Image source: Rawat, 2019)*					Openings are bigger in modern houses without ornamentation
Material	Stone slate, Wooden Joints, Mud plaster	Stone, Mud for Plaster and cement	Mud and cement and load bearing structure	cement and RCC structure	Strength of traditional houses is more due to stone, mud, timber

5) Modern methods of construction style are neither sustainable nor disaster-resilient. Hence, the wrath of natural hazards has been seen to increase in recent years.

This study shows that the traditional knowledge system was used to develop the built form considering the needs of open, semi-open and closed spaces, and has had a major impact on the built environment. In Uttarakhand, out of two regions, namely Garhwal and Kumaon, although the Garhwal region is more prone to disaster, great variety of knowledge for built environment is observed. And hence, it is essential to study the communities' traditional wisdom as they have a vital significance in different life sectors. This knowledge has shown a deeper understanding of climate, culture, construction, and people. It is gained from experience and constant applications. This knowledge has sustained many settlements and heritage as well as protected lives from disasters. It can be concluded from this study that our traditional wisdom can provide sustainable solutions in the present context. As well as these can be studied further in order to deepen the research. Considering the scope of the traditional knowledge systems in Garhwal region, there is a major scope to find out numerous unidentified styles of construction methods and disaster resilience strategies.

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TRANSFORMATION OF URBAN STREETSCAPE
CASE OF MALLESHWARAM, BENGALURU

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ABSTRACT

Urban streetscape can be defined as the collective appearance of all buildings, gardens, pedestrian paths and landscaped features along a street. The aim of this research is to study the transformation of the urban streetscape in Malleshwaram. The main objectives are to understand the various building elements in the local context of Malleshwaram in Bengaluru and to analyse the different building typologies on 15th Cross Road, 4th Temple Street and Sampige Road in Malleshwaram. Buildings on this street have undergone a transformation in terms of façade treatment, scale, material usage, form and typologies over the last 3 decades. The traditional streetscape has given way to a blend of both old and modern buildings. Here, the local architectural features that have upheld the identity of the neighbourhood are also getting deployed.

Keywords: *Urban Streetscape, Transformation, Building Typology, Facades*

1. INTRODUCTION

'Streetscape' refers to urban roadway design and conditions which impact the street users and the residences. It is the important factors that help in representing the city's culture globally. For any city, the streets are a reflection of its cultural and traditional values (Gupta 2021). Streetscaping is the decisive factor in a city's progress. Components of urban streetscapes are sidewalks, street corners, trees and landscape strips, planters, benches, lighting, trash receptacles, signage, public art, residences, etc. (Rehan 2013).

This study will show the residences in the streetscape and their heights, façades and materials. Globalization and urbanization resulted in public space being continuously transformed. This process of transformation develops a continuous change in perception and socio-cultural meanings to public spaces like streets. Political, economic and infrastructure changes have led to the transformation of the built forms and public spaces like streetscapes (Khatavkar & Chinappa, 2021).

The paper shows the study of the transformation of the urban streetscape in Malleshwaram. The main objective was to understand the various building elements in Bengaluru's local context, that is, in Malleshwaram and analyse the different building typologies at 15th Cross Road, 4th Temple Street and Sampige Road in Malleshwaram. Different design elements in the buildings are identified and analysed to examine the reasons behind the transformation.

Malleshwaram which is in the north-western part of Bangalore, is one of the oldest neighborhoods in the city. The name 'Malleshwaram' has been taken from the Kadu Malleshwara temple located in the area which is built in Dravidian style. Malleshwaram was built at the foothills of Kempegowda Watch Tower and Palace Guttahalli. Initially forest land, it was transformed into a suburb when the plague hit Bangalore in 1889.

The neighbourhood is characterized by streets laid in a grid iron pattern with ten main roads running north-south and seventeen crossroads running east-west. Malleshwaram was first imparted into eight blocks based on caste (Nair, J., 2018, p.xxvi). The areas selected for the study are Sampige Road and 15th Cross Road, 4th Temple Street which have residential, commercial and mixed-use buildings (see fig. 1).

Figure 1: Plan of Selected study areas in Malleswaram
(Source : Authors)

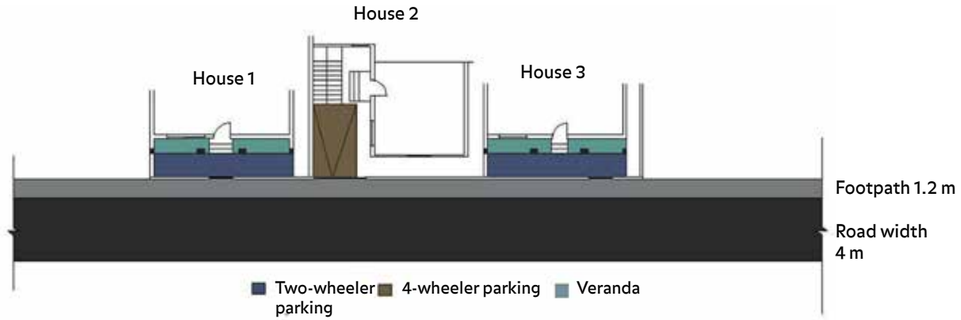

Figure 2: Edge condition- Malleswaram streetscape in the 1980s
(Source : Authors)

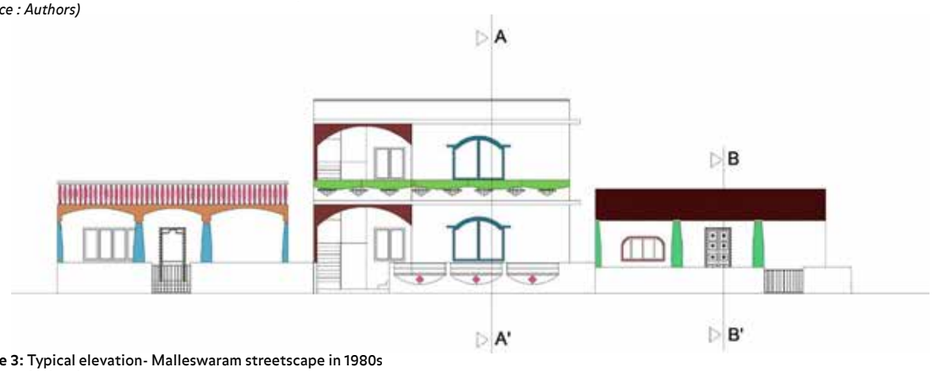

Figure 3: Typical elevation- Malleswaram streetscape in 1980s
(Source : Authors)

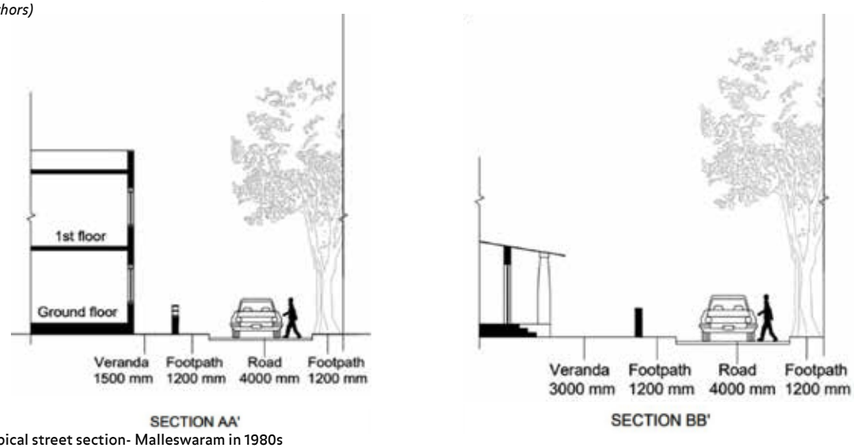

Figure 4: Typical street section- Malleswaram in 1980s
(Source : Authors)

4.2.1 RECOUNTING MALLESHWARAM STREETSCAPE IN THE 1980s

In the 1980s, Malleswaram was a neighbourhood with large bungalows built in Art Deco or Late Modernist styles, set on large plots. A combination of survey methods including interviews with residents and survey of old photographs was carried out to understand the streetscape that existed in the neighbourhood in the 1980s (See fig. 2).

Figure 3 shows a typical elevation of the houses of the 1980s and figure 4 shows the street section of the Malleswaram's houses. It has timber doors and windows with ornamented shutters and frames and various kinds of parapet walls. Mangalore tile roofing was extensively used. Buildings were usually only single-storeyed. The important features in the streetscape of the past have been noted in Table 1.

4.2.2 MALLESHWARAM IN 2021

A survey of selected streets in Malleswaram was carried out to understand the transformed streetscape in the neighbourhood. Stretch A (Sampige Rd.) consists of 15 houses, where each one is displaying a distinct style and timestamp through its facade (see figs. 5 & 6). This stretch has only two modern buildings constructed

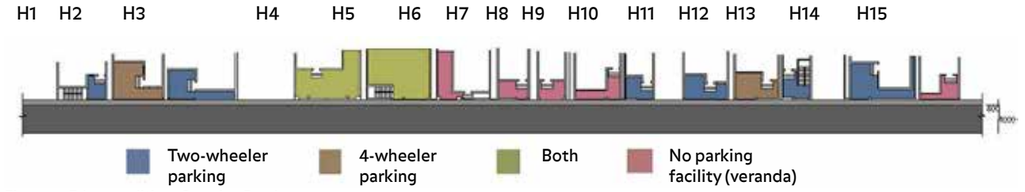

Figure 5: Edge condition- Sampige Road
(Source : Authors)

Figure 6: Street elevation- Sampige Road
(Source : Authors)

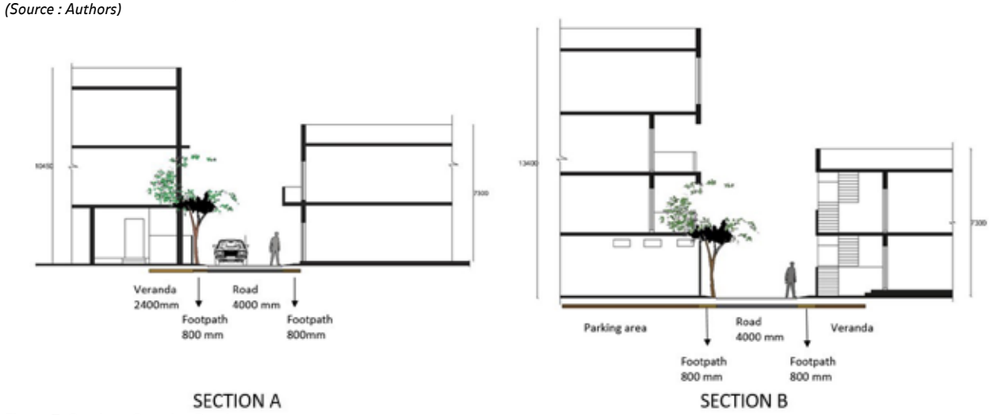

Figure 7: Section - Sampige Road
(Source : Authors)

recently (houses 5 & 10). Stretch B (15th Cross Road and 4th Temple Street) is a combination of commercial and mixed use buildings which were built with different age gap. Out of four buildings, two are commercial and the other two are mixed use buildings. This stretch has different heights of buildings ranging from G+2 to G+3.

Figure 7 shows the section through Samipge Road with levels of the street. While old buildings have normal casement windows, trapezoidal roof projection and RCC balcony railings, recently constructed buildings have corner windows, glass panel railings for balconies and box chajjas. Older buildings are characterized by arched porches and arched windows. Newly constructed buildings bear glass facades and often serve as backdrops for large advertisement panels (see fig 8 and 9).

The analysis of street sections shows that the building form and ground coverage have transformed to acknowledge the rising land value in the neighbourhood. Close to 100% ground coverage with little or no setbacks seems to have become the norm in direct violation of the bye-laws. Most of the buildings cater to mixed-use with commercial usage such as shops, restaurants and offices on the ground floor. Table 2 lists the characteristics of building facades along with the building age.

COMPARISION STUDY

Before the 1980s, Malleshwaram streets consisted of houses which were mostly single-storeyed with pitched roofs. Doors and windows were normally made of wood. Materials used for construction were mud bricks, stone, clay and other naturally available materials. Today, a variety of textured stones, brick, cement and glass are used for construction. As we walk through Malleshwaram's streets, we can see buildings with glass walls and stone-clad buildings. People started using the ground floors as parking spaces to accommodate their automobiles according to their needs. They also started to explore new construction techniques which reduced the construction time. The height of the building is also taller compared to older buildings.

REASONS FOR CHANGE

These changes have come about because of the increases in land prices and population. As the population grew, there was a shortage of land and also due to the increase in land prices, people started to share the land to reduce the cost. They started to build multi-storeyed buildings which solved problems like cost and increased population. As Malleshwaram is in the city's centre, malls and commercial buildings evolved with transportation facilities. As Malleshwaram got

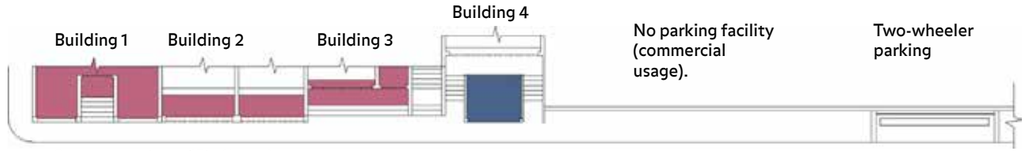

Figure 8: Edge condition-- 15th Cross Road
(Source : Authors)

Figure 9: Street elevation- 15th Cross Road
(Source : Authors)

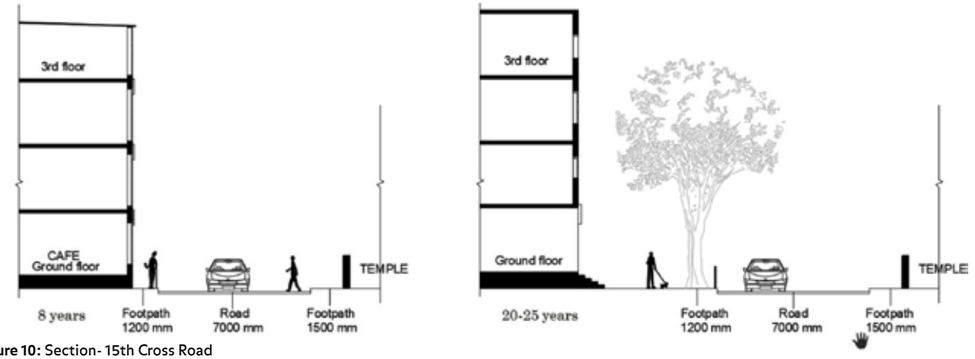

Figure 10: Section- 15th Cross Road
(Source : Authors)

reinvented with malls and restaurants, people started residing there and followed contemporary trends. Some people preferred selling their plots to developers, who started constructing apartments as the demand for land increased.

RECOMMENDATIONS

The guidelines contain the design considerations to avoid the cons of streetscape transformation and also how to improve or beautify the streetscape. Nowadays socializing spaces are barely seen in the residential front yards. In earlier houses, these had provided a space for interaction with the neighbourhood. Providing socializing spaces in the new buildings will be an interesting feature. Residences should consider landscaping areas in their designs. This makes the streetscape more interesting and appealing, along with which, it provides a natural canopy while walking on the sidewalks. Traditional parameters can be used in a modern way. For example: making the courtyard a multipurpose space for gardening and playing area. Also, a courtyard can be altered by creating decks and adding skylights on its roof, adding water features and creating a peaceful atmosphere using plants. To keep the essence of the traditional style, both traditional and contemporary styles can be blended to lend it uniqueness. For instance, this can be done through the use of columns in the interior spaces. An increase in building numbers has led to decrease in trees and plants. Hence, creating green facades, vertical gardening and roof gardens makes the exterior of the building more appealing. Designing wide roads in the future planning of the city can solve traffic problems and also allow the residents to have a comfortable life.

CONCLUSION

It is quite evident from the study that Malleshwaram has lost its identity by transforming from traditional to contemporary as reflected in its changing built forms, material usage, architectural elements and spaces. Streetscape transformation is a common phenomenon in most growing cities. However, in the stages of transformation, certain vital elements of the neighbourhood - such as socio-interactive spaces, greenery, traditional facades and neighbourhood identity are being lost. The onus for creating a contemporary yet lively streetscape for our neighbourhoods rests with present-day architects. Just as construction activity and neighbourhood development mark the progress of the city, sensitivity towards local architectural character and traditional streetscape can be one of the markers for developing our cities in the future.

Table 1: **Streetscape characteristics as recounted by residents in Malleswaram in the 1980s**
(Source: Authors)

No	House	Description
1	*House 1 (Grd. structure)*	Series of segmented arches used in verandahs support by columns and parapet. Floral patterns can be seen on doors.
2	*House 2 (G+1)*	Segmented arch entry, arched window and patterns on parapet and compound wall.
3	*House 3 (Grd. structure)*	Mangalore tile roofing with eaves hanging and floral patterns on door shutters, columns supporting the roof.
Building elements		
1	*Traditional Façade*	Doors: Timber-framed doors with floral patterns on door shutters Windows: Floral patterns on window frames Entry porch: Arched entry porches Material: Timber for doors and windows, concrete for arches, Mangalore clay tiles for roofing.
2	*Height*	Building height was restricted to G+2 structure.
3	*Typology*	Residential, mixed use
4	*Material*	Use of timber, concrete
5	*Roof and Form*	House form was mostly square with courtyard in the centre with pitched roof.

Table 2: **Streetscape characteristics as seen at present in Malleswaram**
(Source: Authors)

No	Building	Description	
1	*Building 1 (G+3)*	Glazing wall for facade and aluminum cladding at plinth level for each floor of the building.	8 years
2	*Building 2 (G+3)*	Projecting window façade for 2nd and 3rd floors. Aluminum cladding at plinth level for each floor of the building.	8 years
3	*Building 3 (G+2)*	Segmental arches; porch for entry of the building at the 3rd floor and segmental arches at the parapet wall; Casement window at second floor.	10-15 years
4	*Building 4 (G+3)*	Pseudo center arched window.	20-25years
Building Elements and Characteristics			
1	*Façade*	Window: casement window Chajja: trapezoidal chajja, rectangular chajja. Roof: flat roof, sloped roof projection.	
2	*Height*	Height of the building goes up to G+3 with flat roof.	
3	*Typology*	Residential, mixed use	
4	*Material*	Use of glass panels for balcony, RCC chajja,RCC-structure.	

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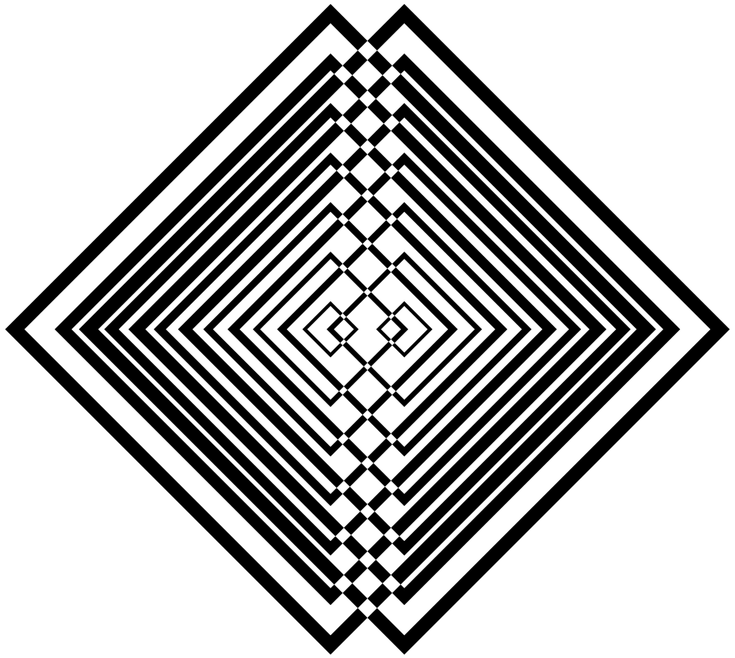
A HOLISTIC REVIEW OF THE PERFORMANCE OF THE PASSIVE DOWNDRAUGHT EVAPORATIVE COOLING SYSTEM AS A PARTIAL SUBSTITUTE TO AIR CONDITIONING IN HOT AND DRY CLIMATES



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ABSTRACT

The objective of this paper is to review the functioning of the passive downdraft evaporative cooling system in vernacular as well as contemporary architecture and suggest appropriate means of integrating it with air-conditioning in order to offset the inherent drawbacks of both the systems. The methodology adopted to achieve this objective was revisiting the fundamental principles of the conventional PDEC in order to summarise the advantages and shortcomings in the functioning of PDEC in contemporary buildings and analyse the pros and cons of PDEC through energy simulation exercises. The major findings of the paper include an analysis of the contributions of some of the major parameters towards the performance of PDEC which offer an insight into the possible improvements in the performance of PDEC through innovations and their repercussions.

Key words: *Passive, Cooling, Downdraft, Energy, Evaporation*

1. Introduction

With the growing awareness of reducing the energy consumption in buildings, conscious attempts are being made to improve the energy efficiency of the conventional air-conditioning system, which has been established to be the largest contributor to operational energy consumption in buildings. In addition, air conditioning has also proven to be a major contributor to HFC and CO2 emissions. Post-COVID, the healthiness of the conventional air conditioning system is being questioned, on account of the large percentage of recycled air used and a school of thought has even started questioning the need for air conditioning for human comfort on account of the risk that it poses to human health in a pandemic situation. As part of the international efforts towards reduction in energy consumption and GHG emissions, various organisations have been increasingly emphasising the need for re-introducing proven passive air-cooling techniques for thermal comfort in building design, which have been part of the rich vernacular architectural traditions in our country as well as other parts of the world.

While significant research and advancements have been made in the field of conventional air-conditioning, the comparative degree of research and development on passive air-cooling techniques has been much lesser, and the architectural profession, as well as the science of air-conditioning, has not advanced much on this front. Wherever passive cooling techniques have been incorporated into contemporary architecture, the results have indicated a significant reduction in energy consumption. However, these techniques have not been able to offer completely satisfactory solutions in respect of achieving the desired comfort conditions on account of their limitations and lack of adequate research. Besides, the functioning of these techniques is heavily dependent on external climatic conditions and there is a need, therefore, to look at the integration of active and passive energy-saving measures in order to achieve the best results.

This paper focuses on Passive Downdraught Evaporative Cooling (PDEC), a passive cooling technique used very effectively for achieving indoor thermal comfort in the vernacular architecture of hot and dry climatic regions all over the world. The paper seeks to take an overview of the origin of the PDEC system, its suitability as a substitute for conventional air-conditioning, the role played by different parameters towards its effective functioning and the significant improvements carried out in the original system over the years.

2. Objectives & Methodology

The objective of this paper is to review the functioning of the passive downdraft evaporative cooling system in vernacular as well as contemporary architecture and suggest appropriate means of integrating it with air-conditioning in order to offset the inherent drawbacks of both the systems.

a) Revisit the fundamental principles of the functioning of PDEC and its successful applications in vernacular architecture.
b) Enumerate the drawbacks of air-conditioning in today's scenario.
c) Critically evaluate the advantages and shortcomings of using PDEC as a partial substitute for conventional air conditioning in contemporary buildings, through case studies and energy simulations.
d) Evaluate the effectiveness of the different innovations and improvisations carried out in PDEC over the years to overcome its shortcomings.
e) Suggest a way forward in terms of integrating PDEC and conventional air conditioning to obtain the best results.

The methodology adopted to achieve this objective is:

a) revisit the fundamental principles of the conventional PDEC
b) summarise the advantages and shortcomings in the functioning of PDEC in contemporary buildings
c) analyse the pros and cons of PDEC through energy simulation exercises.

3. The functioning principles behind PDEC

PDEC works on the basic concept of evaporative cooling in hot and dry climatic areas, utilising the fact of high latent heat required by water for evaporation. It captures the dry winds that flow at a certain height in hot and dry climatic regions, by blocking the path of the wind, and densifying it by adding moisture to it. In the process, it utilises the principle of buoyancy for inducing air movement by natural means rather than relying on fans as mechanical means. This densified, moist, unsaturated and cooled wind is led downwards and into the living areas by wind towers, absorbs heat from human bodies, walls, floors and ceilings and equipment and becomes rarefied in the process. The rarefied air is then directed to exit outdoors, either through the PDEC itself or through a solar chimney used in conjunction with PDEC. These parallel and complementary movements of air columns create an air cycle, which performs three primary functions :

a) it brings down the indoor ambient temperatures to within the adaptive comfort range with the minimum use of energy
b) it ensures effective air movement, successfully resulting in the movement of large volumes of air without the requirement of fans

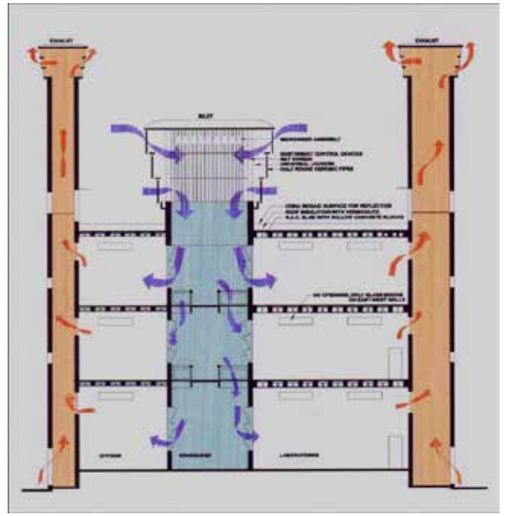

Figure 1: Air Flow patterns in a conventional PDEC
(Source: Thomas & Baird, 2004)

c) it increases indoor RH to within the comfort range; often the RH exceeds the comfort range
d) circulates fresh air to the occupants with minimum energy consumption (Figure 1).

4. Applications of PDEC in vernacular Architecture

The origin of using PDEC for evaporative cooling lies in the vernacular architecture of Egypt, from where it subsequently spread eastwards through the Middle East and Iran to north India with the Mughal empire, and westwards across North Africa to southern Spain (Ford, 2012). Taking advantage of the hot high-speed winds that blow unobstructed above the building skylines, wind catchers were used to capture the wind and direct it over porous water pots, causing evaporation and bringing a drop in temperature as a result of latent heat of vaporization (ibid). (see Figure 2)

The wind catcher contributed toward three important parameters of thermal comfort:
a) lowering the indoor ambient temperatures
b) ensuring an adequate number of air changes
c) increasing the indoor RH to more comfortable levels corresponding to the indoor ambient temperature.

Thus, while the dry bulb temperature falls, and the relative humidity increases, the wet bulb temperature remains more or less constant. There are two ways in which the passive cooling of the air can take place:
a) by means of direct evaporative cooling whereby the air coming in direct contact with moisture
b) by means of indirect evaporative cooling whereby the air coming in contact with the walls and roofs of the structure whose surface and core temperature is much lower than the air temperature.

In the latter case, the diurnal difference between the indoor and outdoor temperatures which gets maximised by afternoon is 'dampened' by the thermal mass of the stone or earth masonry, and the air is further

Figure 2: PDEC in vernacular Architecture of Middle East
(Source: Elborombaly & Prieto, 2015)

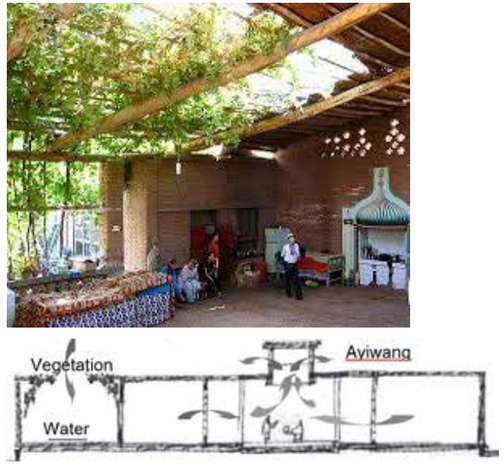

Figure 3: PDEC in vernacular Architecture of China
(Source: Xuan & Lv, 2017)

cooled by the evaporation of water in the ventilation airflow path. The design of these buildings involved an empirically based understanding of how to exploit ambient heat sinks to promote thermal comfort (de Melo & Guedes, 2006). The use of PDEC has also been found in the northwest regions of Gansu, Xinjiang and the Ningxia provinces of China, which are primarily hot and dry climatic regions. In these regions, the concept of PDEC is utilised in the form of a light well called 'a yi wang', which induces indoor air movement as well as a reduction in indoor temperatures (Xuan & Lv, 2017) (Figure 3)

5. PDEC as a partial substitute to conventional air conditioning- a critical evaluation

An evaluation of PDEC's performance by means of case studies and energy modelling yields some important results. For the purpose of this paper, the following five case studies and literature studies have been considered:

a. Case Study: Torrent Research Laboratories, Ahmedabad (Hot and Dry climatic zone), India

One of the finest successful applications of the concept of PDEC is Torrent Research Laboratories in Ahmedabad, a hot and dry climatic zone, where PDEC has been used in conjunction with conventional air conditioning. Out of a total of six laboratories and office blocks comprising a built-up area of 20,000 sqm, four laboratories are being cooled with PDEC, constituting about 72% of the total built-up area (see Figure 4). Some important results (Thomas & Baird, 2004) with respect to the comfort conditions and energy consumption in these laboratories as observed over a period of time are as follows :

i) Internal maximum temperatures were found to be about 5 degrees lower than the average external temperatures.
ii) Internal maximum temperatures were found to be about 12-14 degrees lower than the peak external temperatures. Temperatures of 29-30 degrees have been achieved when the external temperatures touched 43-44 degrees peak summer temperatures. This is very close to the recommended indoor temperature for mixed ventilation mode buildings as per ECBC 2017, which prescribes that the indoor operative temperature for mixed-mode buildings should be = (0.28 x outdoor temperature) + 17.87.
iii) Indoor temperature fluctuations were in the range of 4 degrees over a twenty-four-hour period when the fluctuations in external temperatures were in the range of 14-17 degrees, thus indicating greater stabilisation of indoor temperature than the external temperature.
iv) Number of air changes was found to be in the range of 6-9 per hour, which is as per the range of recommended air changes as per NBC 2016, which prescribes that the number of air changes should range from 6 to 15 for naturally ventilated laboratories.
v) The total annual average energy consumption by all the buildings per sqm of built-up area, using the mixed-mode ventilation system (Air conditioning + PDEC) was found to be approximate 54 kWh/m^2, as against the average figure of 280-500 kWh/m^2 for air-conditioned office buildings in India. This is much below the figure of 140 kWh/m2 laid out for fully air-conditioned buildings in India by ECBC 2017. It needs to be highlighted that besides savings in energy on account of air-conditioning, the use of PDEC also leads to significant savings in the electrical energy used by fans which, on an average, constitutes about 25-35% of the total electrical energy in office buildings (Ford, 2012).
vi) However, this energy-saving needs to be offset against the energy consumption by pumps on account of pumping of water to the top of the PDEC tower for which no average figures exist.
vii) It was established by a survey carried out on the occupants of the building that, on a scale of 1 to 7, health and productivity received a rating of 4.7, thus indicating a reasonable degree of comfort and satisfaction from the point of view of the user.
viii) The performance of the system and the indoor comfort conditions deteriorated when the outdoor and indoor relative humidity increased. The system started losing its effectiveness when the external relative humidity increased, and there are recorded instances where it created a sensation of discomfort for the occupants during the humid season.

Figure 4a: Torrent Research Laboratories, Ahmedabad
(Source: Thomas & Baird, 2004)

Figure 4b: Plan of Torrent Research Laboratories, Ahmedabad
(Source: Thomas & Baird, 2004)

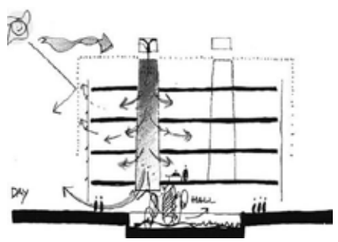

Figure 5: Daytime functioning of PDEC in office building in Catania
(Source: Kamal, 2016)

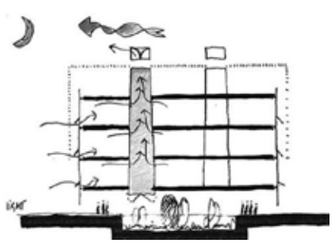

Figure 6: Night time functioning of PDEC in office building in Catania
(Source: Kamal, 2016)

Figure 7: Office Building in Catania, Italy by Mario Cucinella Architects.
(Source: Kamal, 2016)

b. Energy Simulation Study: Office Building in Catania, Italy
Mario Cucinella Architects proposed a design for a four-storeyed office building in Catania, Italy, consisting of nine 3m diameter glazed cylindrical PDEC towers, which would rise above the roof by about 6 m. External air would enter the towers via high level openings and, after circulating through the building, exit through the double-skin façade. The towers also served the purpose of nighttime ventilation and bringing the daylight into a deep plan space (Elizabeth and Ford, 1999). (Figure.5, 6 and 7).

Thermal analysis of the building was undertaken by ESII using PASSPORT-Plus in which a PDEC tower model had been incorporated and the CFD program FLUENT. The following inferences were drawn from the thermal simulation analysis:

i) The tower height should be 6m above the building roof
ii) Acceptable indoor thermal comfort conditions could be created with PDEC, with the external temperature being 29ºC and an internal heat load of 30.7 W/m2
iii) However, it was observed that comfort conditions could not be created throughout the year with PDEC alone, and it had to be supported by a mechanical cooling system.
iv) An annual saving of 27% could be achieved by using PDEC in combination with Air-conditioning in comparison with a fully air-conditioned building.
v) The water demand for PDEC cooling was equivalent to 10 litres per person per day

c. Case Study: N.I.I.T, Neemrana (Hot and Dry climatic zone), India
Another successful example of an institutional building located in a hot and dry climatic zone having achieved acceptable indoor thermal conditions through a judicious combination of earth air tunnel system, PDEC, solar chimney and air conditioning is N.I.I.T, Neemrana, Rajasthan. (Figure 8). Important observations from the studies carried out by the Architects prior to deciding on PDEC are as follows (Gupta, n.d.) :

i) PDEC alone would not be able to control dust and humidity. This necessitated the need to have a mixed-mode ventilation system.
ii) In several buildings using PDEC both for ingress of fresh air and egress of stale air, quite often the indoor spaces did not receive an adequate quantum of air circulation and the required frequency of air changes, thereby resulting in the decision to combine PDEC with solar chimney.
iii) In line with the concept of adaptive comfort as advocated by ASHRAE 55, the designers decided to set the indoor comfort temperature range to between 28-30 degrees C, breaking away from the conventionally used comfort temperature range of 23-26 degrees C, with humidity at 65% (+/- 10%). This has also been a contributing factor to achieving the desired indoor comfort conditions.
iv) Post-construction, some important outcomes of the use of PDEC are as follows:
a) The building has been able to achieve an EPI of 33 kWh/sqm/year as against the ECBC stipulated norm of 140 kWh/sqm/year.
b) However, as a disadvantage, winter heating is not possible through this system.
c) The air circulation through PDEC varies its direction of flow as per the external weather conditions.
When the outdoor temperature is higher than the indoor temperature, (for instance in the summer afternoons), subject to a minimum external air movement, the PDEC tower will draw the external air downwards into the internal areas as a reverse stack effect. On the contrary, when the indoor temperatures are higher than the outdoor temperatures, (for instance in the early mornings and late evenings), the stack effect forces the indoor air, warmed due to the absorption of thermal energy from indoors, to rise through the PDEC and exit outside.

d. Energy simulation exercise: Office building in Seville, Spain (Hot and dry climatic zone)
An energy simulation exercise was carried out for a hypothetical office building comprising PDEC in Seville, Spain, a hot and dry climatic zone, to predict the possible results in terms of Atrium comfort conditions and energy efficiency. (Figure 9). Some important results (Robinson, et al, 2004) of the energy simulation exercise are as follows:

Figure 8: N.I.I.T Neemrana Campus with PDEC and peripheral exhaust shafts
(Source: Gupta, 2014)

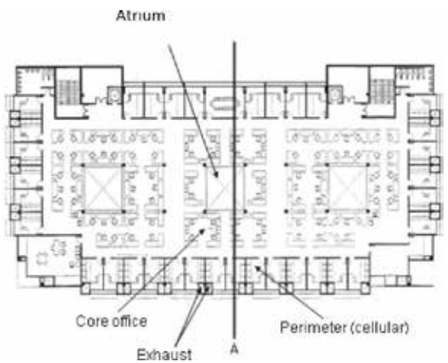

Figure 9: Typical floor plan of a hypothetical PDEC building design -Atriums act as wind towers and the peripheral shafts as solar chimneys
(Source: Robinson, et al, 2004)

i) Taking 26 degrees C as the upper limit for indoor comfortable temperatures, PDEC alone would be insufficient to provide the required comfort conditions for the entire year. Even after augmenting PDEC with additional thermal control measures such as night venting, low thermal gains and increased airflow volume from PDEC, temperatures exceeding 26 degrees were observed in the core areas for about 200 occupied hours.
ii) This in turn resulted in overheating of perimeter zone areas, which turned out to be warmer than the core areas by about two degrees. The overheating was observed to last for about 400 hours.
iii) The extent of annual overheating even after optimizing the PDEC performance and activating night ventilation exceeded the comfort criteria by a significant margin.
iv) PDEC has so far not proven its effectiveness in achieving the desired comfort conditions without some form of mechanical support. However, in spite of the necessity of mechanical cooling to supplement the functioning of PDEC, there are proven substantial Co2 and energy savings in the use of PDEC vs. mechanical cooling.
v) It is possible to stabilise the indoor thermal environment to some extent along with achieving substantial energy savings for cooling by appropriately balancing the air flows and close monitoring of PDEC operations.
vi) A comparison of the primary energy consumption, Co2 requirements and water consumption per floor area between PDEC cooling and air-conditioning results in the following important observations are shown in Table 1.
• Savings of about 76% in the primary energy consumption compared to air conditioning are possible with cooling set-point of 26 degrees C and low internal heat gains.
• Savings of about 83 % in the primary energy consumption compared to air conditioning are possible with cooling set-point of 26 degrees C and high internal heat gains. This is on account of the significant increase in primary energy consumption due to higher internal thermal gains, even though the set point temperature remains the same. Thus, as the internal thermal gains increase, maintaining the same cooling set point temperature of 26 degrees C, the primary energy required for cooling and the water consumption increase significantly.
• Savings of about 50 % in the primary energy consumption compared to air conditioning are possible with cooling set-point of 24 degrees C and low internal heat gains
• Similar savings in Co2 consumption are also highlighted in the table
• It is possible to achieve sufficiently high airflow rates indoors without relying on external wind speeds. With an appropriate balancing of openings and moderation of airflow, it is possible to maintain indoor thermal stability along with substantial energy savings.
• The primary energy requirement for cooling and the water consumption increases significantly with the increase in the internal heat load.

However, all the above-mentioned results cannot be said to be completely accurate, as these are derived from simulation exercises, which are based on various assumptions such as airflow resistance, external conditions, mixing of air masses, indoor adaptive comfort and surface convective coefficients and these need to be applied to actual buildings to get an accurate picture.

e. Energy simulation exercise: School building in Sacramento, California, (Warm and Humid climatic zone), U.S.A

i) An energy simulation exercise was carried out for a hypothetical school building comprising of PDEC, in Sacramento, California, (a warm and humid climatic zone with a large variation in relative humidity), to predict the possible results in terms of comfort conditions and energy efficiency, consisting of two scenarios: a) a base case scenario using the conventional air -conditioning and b) a scenario using PDEC. (Kang & Strand, 2016). Some important results of the exercise are as follows:
ii) A reduction of 95.5% in the energy required for cooling was achieved by using PDEC for indoor comfort as compared to air conditioning. The energy consumed was 179.34MJ as against the requirement of 3994.59MJ for air conditioning. This is partly on account of the energy savings on account of non-use of fans. These figures include the energy required for pumping the water.
iii) The PDEC systems consumed a large volume of water, up to 356.11m3, as compared to 1.5 m3 consumed by conventional air conditioning.
iv) A sharp rise and drop in relative humidity coupled with variations in the ambient wet-bulb temperatures was observed both at the start of PDEC operation and in the evenings. Relative humidity of 40% was observed between 11 am (when the PDEC started functioning) and 2 pm. The Relative humidity increased up to nearly 80% at 4PM in all spaces in Sacramento due to increase of water requirements to meet cooling loads that significantly increased. The relative humidity started dropping at 6 pm, along with ambient temperature decreasing from 23.9 degrees C to 20.9 degrees C. Thus, it turned out that inappropriately designed PDEC towers can significantly increase indoor humidity level, resulting in excessive water consumption.
v) Overcooling of indoor spaces was observed during early morning hours.
vi) The indoor temperatures achieved by using PDEC were more consistent than those achieved by using air-conditioning.
vii) The results of energy simulation have shown that PDEC system having the required controls was able to maintain the indoor thermal comfort level within a reasonable range, while PDEC system without these controls displayed considerable variation in the indoor thermal comfort levels.

6. A summary of the significant advantages and drawbacks of PDEC and their co-relation with major parameters

PDEC has successfully demonstrated its capacity to improve indoor thermal conditions in hot and dry

climates by means of effective reduction of indoor temperatures, adequate air movement and enhanced humidity. However, the most significant shortcoming of PDEC is its incapacity to perform efficiently when the external relative humidity increases. Many of the hot and dry climatic zones in our country have a short warm and humid season, during which the effectiveness of PDEC as a stand-alone system has proven to be insufficient to achieve the desired indoor thermal comfort conditions. There is no option in the current PDEC system for exercising control over humidity. Other disadvantages of PDEC include a) the risk of micro bacterial contamination and blockage of the water nozzles, b) lack of effectiveness in terms of controlling pollution, as compared to air-conditioning. A detailed explanation of the three major means by which PDEC achieves indoor comfort, namely a) reduction in the indoor ambient temperatures, b) ensuring the required number of air changes and c) increasing the RH to the desired levels, is as follows:

i) The quantum of reduction in the indoor ambient temperatures is dependent on the extent of evaporative cooling, the magnitude of indoor air speeds and the specific heat of the building materials used. Water droplet size is the most critical factor that affects the extent of evaporative cooling. The use of wetted pads originates from vernacular architecture. In a study carried out by Pearlmutter et al., the results confirmed that a finer water droplet led to a greater temperature reduction and cooling capacity compared to wetted pads. (Etzion, et al, 1997)

ii) The same has also been established in case of Torrent Research Laboratories, Ahmedabad. The second most important parameter that impacts the quantum of reduction in the indoor temperature is Water flow rate. The results obtained from the simulation studies by Kang and Strand (2009) have shown that both the flow rate as well as the temperature of the air exiting from PDEC is directly impacted by the water flow rate.

iii) Achieving the desired number of indoor air changes by using PDEC has been established to depend on :
a) external wind velocity
b) adequate means of air exhaust
c) height of the tower
d) angle of incidence of the wind on the tower face
e) area of the wetted pads.
The efficiency of PDEC in conditions with a low velocity of external winds has been found to be low. The higher the tower, the greater are the pressure differences between the top and bottom of the tower, and a high-pressure difference significantly contributes to inducing air movement. Results of energy modelling carried out by Kang & Strand (2016) has established that the most effective height of the PDEC tower is between two to three times the width of the tower cross section, and there is no scientific evidence to suggest that its' minimum height should be maintained as 15 m, which is a misconception.

iv) Their research has also established that the height of towers has a linear relationship to air volume flow rate. The higher the external wind speed, the greater is the rate of extraction of the volume of air from indoors. Their research has further established that, for the same area of cross section of the tower, the performance of PDEC is directly proportional to the air mass flow rate, which, in turn, has a direct relationship with temperature reduction. For the same area of cross section, a lower flow rate of the air mass led to a greater extent of temperature reduction as observed by the same researchers. (Kang, 2016). However, as observed, this does not hold good when the cross-sectional area was altered. Although the efficiency of PDEC has been found to be low with low velocity external winds, it has been observed that, even with high velocity of external winds, there have been instances when some of the indoor spaces have been excluded from the indoor air circulation on account of inappropriate locations and sizes of exhaust outlets. The effective indoor circulation of air is not solely dependent on the indoor wind speed and also depends on the design of indoor air circulation. Another significant factor that contributes to the air circulation is the angle of incidence of wind at the entry and exit points from the tower. A scaled model of PDEC was tested for wind pressure coefficients and it was found that the angle of incidence was a determining factor for the wind pressure coefficients (Khan, et al, 2008).

v) It has been established that an increase in the indoor RH is dependent on a) Water flow rate and b) Droplet size. As established by Kang & Strand (2016), in order to achieve the required drop in indoor temperature and humidity without wasting water, the water flow rate should vary as per the outdoor conditions. Studies by Gokarakonda & and Kokogiannakis (2014) have established that, if the water flow rate in PDEC is adequately controlled, it is possible to use PDEC for air cooling in warm and humid climates as well (Kang & Strand, 2016). Simulation studies by Kang & Strand (2016) have established that smaller droplet sizes lead to an increase in the RH. It has also been observed that the efficiency of the system begins to drop when the droplet size exceeds a particular limit.

7. Innovations and Improvisations in PDEC system over the years:

Various innovations and improvisations have been carried out in PDEC to overcome some of its drawbacks. These include technological interventions as well as improvements in the design. Some of the significant modifications are as follows:

i) Use of Desiccant for dehumidifying the incoming air: A Desiccant system uses a desiccant material with low vapour pressure on its surface to reduce the absolute humidity of the air. When used in conjunction with the PDEC, a Desiccant system, therefore, can overcome the shortcomings of the PDEC system in operating in warm and humid climates. Besides, the Desiccant raises the temperature of the air in contact in the process of dehumidification to the advantage of the system. This rise in temperature augments the upward rise of buoyant air through the solar chimney, thus completing the air cycle. (Figure 10). This model has been successfully implemented in some projects worldwide.

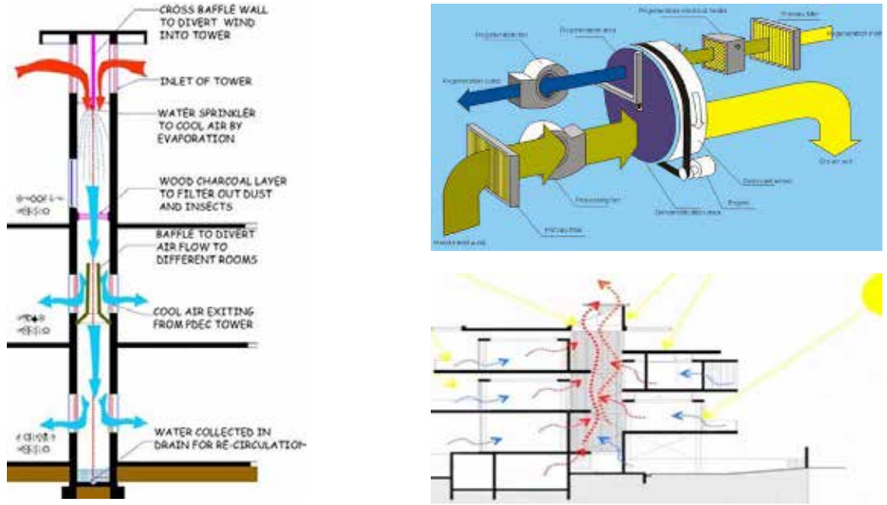

Figure 10: Typical combination of Desiccant with PDEC *(Source: Halid, et al, (2016)*

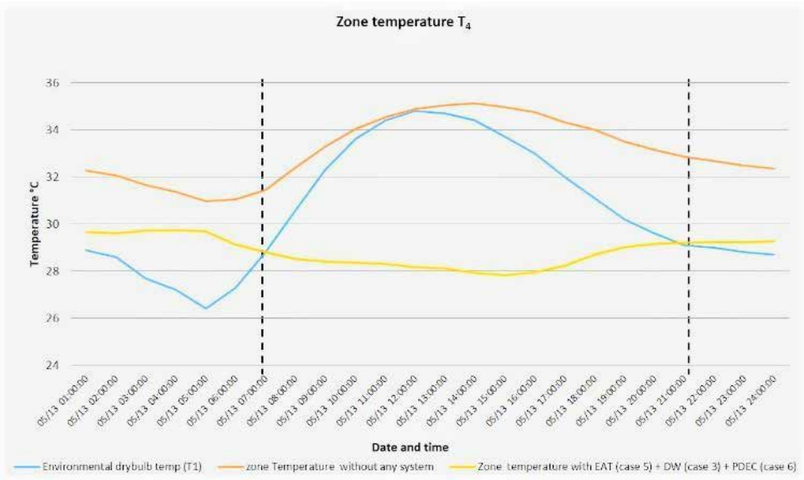

Figure 11: Reduction in internal Zone temperatures on account of Earth Air Tunnel + Desiccant + PDEC *(Source: Gokarakonda & Kokogiannakis, 2014)*

ii) An energy modelling exercise was carried out by Gokarakonda & Kokogiannakis (2014) to infer the results of air cooling by using PDEC in combination with a desiccant dehumidifier and an Earth Air tunnel system for a typical dwelling unit in the warm and humid climate of Vishakhapatnam, where the peak summer temperatures touch 38 degrees C and the average relative humidity throughout the year is above 60%. The results showed that using the EAT+DW+PDEC system as against natural ventilation the following significant results were achieved:

iii) The peak indoor summer temperatures were reduced by about 8 ºC
iv) The indoor relative humidity remained below 75%.
v) Use of PDEC in conjunction with Earth Air Tunnel. Energy simulation studies by Gokarakonda & Kokogiannakis (2014) established that, by using Earth Air Tunnel, it was possible to reduce the indoor temperatures and bring these within the comfort zone (see Figure 11).
vi) Replacement of the conventional PDEC with the double skin façade: Replacement of the conventional PDEC with the double skin façade acting as a wind tower has been successfully demonstrated in some buildings, including a multi storeyed building in Belgium, in which the façade is on the leeward side of the building similar to a wind tower surrounded by a region of negative pressure. Solar radiation falling on the façade augments the stack effect. (Gratia & de Herde, 2007).

8. Conclusions and way forward

Though the concept of PDEC is based on sound climatic principles and has proven itself in the vernacular as well as contemporary architecture of various hot and dry climatic regions of the world, it, nevertheless suffers from some inherent drawbacks, the major ones being its incapacity to function under increased external humidity levels and the significant variations in its performance as per varying outdoor conditions. The results of energy modelling as well as the analysis of its performance in few implemented projects clearly establish the need to integrate PDEC with conventional air conditioning in order to get the best results for achieving adaptive comfort in buildings in predominantly hot and dry climatic regions. In order to overcome the constraint of the loss of its efficiency during humid external conditions, the use of desiccant dehumidifier in conjunction with PDEC could possibly be a workable option, though more work needs to be carried out in this regard. It is possible to use PDEC effectively in warm and humid climates if there are adequate in-built mechanisms to control the water flow. More in depth analysis needs to be carried out to study the inter-relationship between the different parameters that affect the performance of PDEC. Even though the mixed mode ventilation model consisting of PDEC and air conditioning has been recommended to be the ideal one, further research needs to be carried out with respect to deciding the quantum of indoor cooling to be carried out through air conditioning and PDEC respectively. There is strong requirement of carrying out further research on the contribution of all the contributing parameters, including their inter relationship with each other. As on today, there does not exist a validated mathematical model which takes into account these and other parameters, based on which a scientific design of the PDEC system can be carried out.

Table 1: **Comparison of whole building primary energy, Co2 and water consumption calculations**
(Source: Robinson, et al, 2004)

Set point temperature & Thermal gain	Primary energy		Co2 emissions		Water consumption
	Use (MWh)	Savings (%)	Use (tonnes)	Reduction (%)	(m3)
26 degrees C, low thermal gain	95	76	22	75	213
26 degrees C, high thermal gain	173	83	39	82	393
24 degrees C, low thermal gain	283	50	62	50	235

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❶ MS Word document file with text only. Please do not format it in anyway. The numbered captions for all the images will also be in this document.
❷ Folder with all images (minimum 300 dpi), numbered according to the captions given in your text file
❸ Photograph of the author/s (minimum 300 dpi)
❹ Author biodata – Maximum 50 words.
❺ PDF (optional)– showing the intended layout. This pdf should include text and all images, with numbered captions.

Please note:

❶ When you correspond with us, please give your email id (that you regularly use) and your cell no. (preferably with whattsapp).
❷ Please mention your IIA regn. No.
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- For design projects, plans and sections of the project are desirable along with the photographs.
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HELLO STEEL

A SELF-LEARNING HANDS-ON STEEL WORKSHOP

Anood Mahaboob Basha

Azure

The II year students of Chennai Academy of Architecture and Design (CAAD), as part of their curriculum under the subject of Building Material and Construction organised a self-learning hands-on steel fabrication workshop to study the properties and joinery of steel. Under the guidance and support of their mentors, they we planned and executed their designs on paper, transforming them into creations which culminated in a celebratory exhibition. Different themed chairs evolved from a different set of ideas: the structure, anthropometry and comfort of the user were given the first level of importance. The timeline of the two weeks of planning and execution has been portrayed in this article as a storyline.

Introduction

A room should feel collected and not decorated.
Albert Hadley

Working with steel and observing its evolution gave us a memorable experience. Learning about steel and working with it was like two sides of a coin: applying what we knew to plan a piece of furniture, putting thoughts together- a vision of something straightforward, however, ours to claim. From conceptualization to materialization and execution the hands-on workshop was an occasion filled with curiosity and fervour.

Hello, Steel: What's your quote?

The conception of five distinctive-themed pieces of seating furniture took a full week of ideation and research.

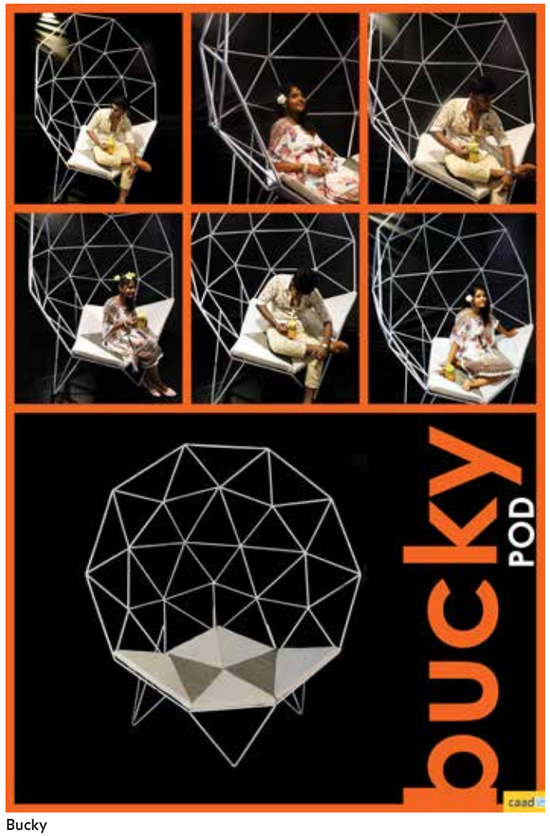
Well, did we think we were done with the hard part? Yes, we did, but approaching the sellers and bargaining on the cost of materials and labour was an entirely new definition of difficult! The first task at hand was to find proficient welders with low labour costs. The quote given by the first welder we had approached exceeded our estimated budget. Our aim was to find welders who provided a quality output for value. After a couple of enquiries, we were fortunate enough to find another fabrication contractor who matched our requirements!! Yayy!!

Azure

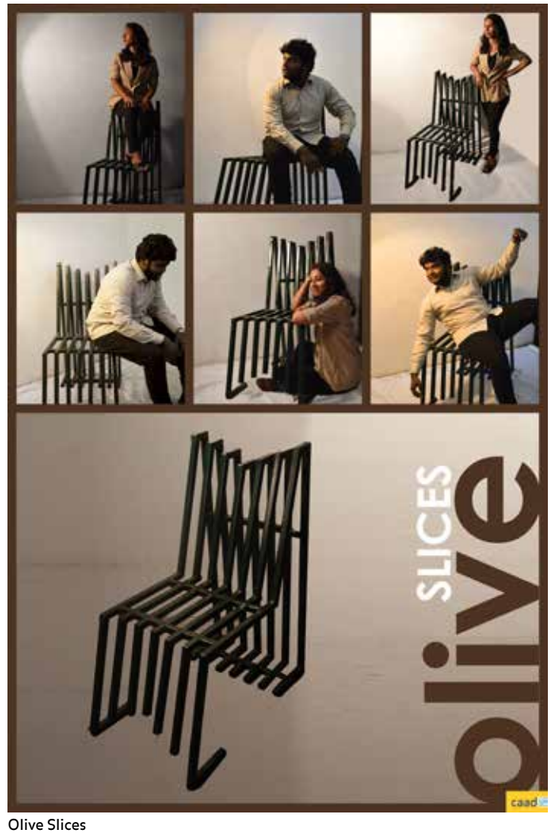
Bucky

Olive Slices

Royal Cathedra



Bucky



Olive Slices

Royal Cathedra

Hands-on

While discussing with the welders, we found that making them understand the stream of the design was harder than the planning process. Many communication clashes were seen- the workers adopting feet and inches and not the metric framework of estimation, their lack of knowledge on angles and geometry etc. were obstacles that we had to cross (and we did!). In spite of facing the practical hurdles of onsite execution, we delighted in making alterations in design during execution for practical reasons. We were unaware of the technical requirements of the shaping and welding process and so we re-drafted the design concurring to the specialized points of interest required by the welders.

On the day of the workshop, we faced difficulties while working with the welders. The materials we requested fell short leading to a long break in the work. The efficiency of the labourers varied, where one worked for a long time and another needed rest (well we didn't leave him be though!!). Whew! One down, but there was more to go!

Pick a price

The material cost fluctuated day by day. The estimate given by the dealers differed from one another for the cost of materials and transportation. After going on a small hunt, we found a steel dealer nearby, and the material order was placed. The labour cost was ₹1500 per day and for the individual rent was demanded for machinery used. Our target was to execute the structure on the first day and apply finishes the next day. But in reality, we did require one of the welders to help us on the following day for final grinding and finishing works. Our total budget was an estimation of ₹11,000 for labour and up to ₹8000 for the material. (On a lighter note, our chairs are high-value!!)

Swing Rocker

Swing Rocker

Tick tock

The welders followed strict working schedules. As the clock struck 5:45 pm they turned off the machines no matter how much work was done (this taught us that tactful communication was important to harness their skill to the fullest). Utilizing scraps, we also made a human sculpture that got wrapped up effectively within the time frame. A special mention to the welder Mr. Pasupathi who joined us on the final day of the workshop. He got accustomed to our way of working and communication and gave us numerous suggestions for efficient material utilization. (He was worth it!!!)

After the finishing touches, the brilliant outcome - the designer chairs, each aptly named, were worth our time and effort. Kudos to all of us who made this a tremendous success!!! We, the II year batch of 2020 extend our thanks to all at CAAD for making this workshop a tremendous success!

All Images Courtesy: **Author**

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PANEL DISCUSSION ON ARCHITECTURE AND THE CITY: A BANGALORE PERSPECTIVE

Ar Bijoy Ramachandran

In late July of 2005, I was invited to participate in an expo in Bangalore. The idea was to give young architects like me a chance to get noticed. I took the stall, but instead of designing and building the perfect bedroom, I set it up with a TV, two speakers and an amp and screened a film. It was odd, to put it mildly. Many people stopped and wondered what this was about. Many wanted my television, some even offered a good price on my jute rug, and then there were some who would sit on the floor and watch.

The film was 82 minutes of architects talking about design, the profession, public processes, professional frustrations, and personal manifestos. Suddenly architecture was out in the public domain, lay people started commenting on design; they found to their utter disbelief that architects didn't drive Ferraris, and holiday in Bora Bora; that planning efforts required designers; that architects did more than just elevations; that truth be told vaastu was the enemy; and that though architects loved to talk (as was evident to anyone watching), almost all of us found communicating with our clients the toughest part of our job.

I kept a diary on site and it is filled with random comments by the visitors on issues rarely discussed in the public domain, issues to do with our built environment, its impact, the political and social meanings attached to it, and the place of design in our lives. It is time now for these discussions to find their way into mainstream media - newspapers, television, etc. Without this extensive and critical coverage the debate about what makes for good architecture, and in turn a good city will never find resonance amongst the most important people in the world, our potential clients.

For the film I met with 24 architects, 3 academicians and 5 students of architecture in the city over the course of two weeks. I collected around 15 hours of footage, traveled close to 500 kms, and lost 5 kilos in the process.

01. DOES DESIGN MATTER? Are there tangible benefits?

Anjali: You're an architect. Make a building, make switches, and make some little lamps. Because everyone will be happy who made this house.
Kiran Venkatesh: Only design matters, if I can put it that way. Design is what gives life to the entire project.
Anil Dube: Oh yeah, I think design matters a lot. It brings about a positive feel in every aspect.
Sathya Prakash Varanashi: Design does not matter. For a happy living, for a comfortable living, where we are with ourselves, the design does not matter. What matters is our heart, our mind, the way we think, and whether we are able to resolve our contextual crises around.
Hareesh Asnani: Yes it does - there's no argument about that. Of course, it matters.
Ravindra Kumar: Yeah, I think so. Absolutely. I think design brings in that completeness, it qualifies that space to generate wealth.
Soumitro Ghosh: Yeah, it definitely makes money. Anywhere good design, from product design to…good design will make money and people are willing to spend more per square foot for a better-designed place than otherwise.
Kavya Thimmaiah: It depends on the target audience, it depends on the market at which you are aiming because in this sort of high-end market, they are willing to pay more for good design. For them, it does matter but if you are doing group housing, mass housing, low-income housing then I don't think for them it really matters.
V. Narasimhan: Extraordinarily. I don't see design as some castle-in-the-air kind of logic - this is the big idea kind of stuff. I see design as an intervention. In India you cannot have solutions, you can only intervene because the rest of the problem is too big to crack.
Sanjay Mohe: Yeah it does matter, I am sure it matters. And there are a lot of these developers who are selling it on the basis of design, not just the quantity. Most of them are talking about quality.
Edgar Demello: The only thing that will run the world is design. It's not about making things for an elitist group - the fundamental nature of the design.
Ranjit Naik: Definitely, no doubt about it.
Nagaraj Vastarey: I really don't think so. Okay if you are just talking about design value and its remuneration, I really don't think so because quite a few times clients have cribbed about it (my immediate neighbour makes so much more money without all this). A well-designed building may not sell better.
Arunjot Singh Bhalla: Design is essence. Design is core.
Janardhan Reddy: Yes, design has mattered.
K. Jaisim: I would put it in the higher step and say architecture matters.
Prem Chandavarkar: Design does matter. We tend to look at art and design as some kind of luxury, but actually, you think about societies whose struggle for survival is most precarious - you look at rural societies, at tribal societies - they are highly embedded in art, in terms of the way they decorate their walls, in terms of the artefacts they make. It is only people whose struggle for survival somehow is not so precarious who suddenly say that art is a luxury. So I think we need to connect to the fact that art is actually something very fundamental to survival, that's the way we are as humans.

02. IDENTITY, STYLE & CONTEXT: the Question of 'place' - public/private

Anup Naik: We're losing our identity. Basically, that is where the problem lies. We are not probably getting back to reacting to our own environments. This whole business of globalization has actually made most buildings look similar - you take a building in Dubai, you take a building anywhere in south-east Asia, or look at it in India.
Hareesh Asnani: From a distance but. (laughs)
K. Jaisim: Today we are in a different ethos. Is technology pushing us? Yes. Is tradition and culture pushing us? Yes. But where will the fusion come? I feel it is now time for each of us as an architect or as a creative person to slowly find an identity true to this soil and to this origin.
K.S. Ananthakrishna: In fact, one German professor asked me the question, "Why is it that I don't see anything Indian in some of the modern buildings coming up in Bangalore?", and I explained that the general culture of Indians is that they try to mimic the west.
Ranjit (S): It's a clear imitation of the west.
Tony Kunnel George: We find it easier just to mimic the west. Buy the materials from what is happening internationally, apply them to buildings and see if the architecture looks good. We don't try and script a language that is wholesome.
Sanjay Mohe: There is an excessive obsession with this transparency which is probably a totally western influence. And then you create these transparent facades and try to close them again with curtains and blinds. In this whole transparent city, there is no place for a ray of light.
Nagaraj Vastarey: Being in the 21st century, I guess, we need to respect our time. We need to respect the space we are in. So there should not be any deliberate association toward a set trend.
Ravindra Kumar: Making a place has become more of an essential process of doing it right rather than reflecting it in the context. I think because there is not much context here other than the vegetation that we pride around, there is not much history.
Anil Dube: I definitely look at the context. I don't ignore that at all.
Arunjot Singh Bhalla: Not enough is being done Even in our projects and that's the reality. Not enough is being done. I can say to you, and I am on record here, that we will continue to make and improve upon this particular aspect. I think the question is very, very important.
V. Narasimhan: I think it's futile also to think of imposing any kind of…Bangalore as a city is not a heritage city, in that sense, it doesn't have any real character. It's an edge city. I call it a city without boundaries.
Ravindra Kumar: If an edifice exists on one particular part of a street or a fabric, it is complete only when you almost don't even look at it when you pass by. If it is so non-visible, non-screening kind of an act, then in some way that urbanity becomes complete because it's so well networked with the rest of the community.
J. Sandeep: Even analogically speaking, I would say, you could akin this entire approach to something like a game of 'Sudoku'.
Prem Chandavarkar: Trophy architecture tends to polarize opinions. A minority love it but a large majority tend to hate it. And it doesn't talk about how you construct a sense of the street, how you construct a sense of square etc., it doesn't talk about those crucial issues at the city level.
Sudheendhra Yalavigi: City is a collection of buildings over a period of time. As an individual you have to behave as though you are part of a team, you are in a collective realm. When you are designing a building at least take into account what has happened surrounding you. This is completely lacking in the Bangalore community of architects. That may be because as students they were not sensitized to the urban issues, or design issues in an urban context.
Ravindra Kumar: I think most architects when they begin to work, they have good intentions or great intentions if they can believe, but somewhere they get lost.
Nagaraj Vastarey: The city as you have seen has gone bad. There is no coherent thinking. After all, it's a democracy, let's say, but each one of us does what one wants and there is no concern for the overall image.
Prem Chandavarkar: And there is no discourse about how these projects contribute towards the city. The problem we have in India is that there is no theory of the city, any notion of authenticity of our culture is always rooted in the village. So I think we need to learn how to think of our cities as cultural entities and to look [at] how architecture contributes towards that culture.
Tony Kunnel George: That's where we have lost it. At every convention, we talk [about] how we take the city forward. Do we need a style, is it vernacularism or is it cultural? For fifty years, we have been talking [about] this. We've never come together and said how do we make this on a platform where the economics of this work. Because, finally, at the end of the day its economics that makes anything happen.
K. Jaisim: The immediate or the ad-hoc seems to rule, rather than the long term. What should really culture into themselves as an experience? I don't think that is still in the Indian architectural context.
Tony Kunnel George: In today's world, we all seem to be lost in this romanticism. It cannot be. The world is different. It's eclectic. Races are coming together. You cannot create a strong structured fabric. It is imperative that there is going to be an eclecticism that is going to arrive.
Arunjot Singh Bhalla: I think that the work that is happening is resonating with the eclecticism of the city. That cannot be used as a guise to explain away bad design. It cannot be a convenient answer.
V. Narasimhan: In some sense, if you look at the way, say, shopping areas are designed in the west. American architects always come up with, "You know, what we need is some of that messy vitality." What we have in India is actually extremely messy vitality.
Rajmohan Shetty: The whole notion of the public realm has been put on the back burner or forgotten.
Nisha Mathew-Ghosh: Are we designing outdated community vehicles? Yeah, absolutely, I think we just need to re-look at how society has changed significantly. Not that we buy consumerism, not that we have to accept it in its full form. But there's a very real change happening. We just need to understand that, I guess.
Soumitro Ghosh: But I seriously feel that there are other options which are not as radical as whether it is having a

park or a mall. I think there are possibilities of in-betweens which can become very exciting public places.
Kiran Venkatesh: I think for a long time, the generation of public spaces used to be [in] the realm of the city. The cities would define policy, they would have guidelines which say this is how public space is defined. They are no longer able to do that. We have to look to developers, we have to look to a combination of developers with the interest and intelligence and good architects to generate that in the commercial projects.
Nisha Mathew-Ghosh: Private enterprise driving public domain, as you very rightly put it.
Kiran Venkatesh: Incentivize it to these builders saying, "You do the ground floor a certain way, or you do the site and the parking a certain way and you get the incentive of an extra floor."

03. THE CLIENT V/S THE ARCHITECT V/S THE CITY: Is there a conflict?

P.K. Venkataramanan: I would not call them conflicts. There are problems in these areas. When you deal with each other there are problems. And all problems have solutions.
Ravindra Kumar: Each of them in isolation has its own agenda. In any part of the world, this is a fact. But I think it becomes complete only when it's a very harmonious kind of integration of all these three modules.
Sathya Prakash Varanshi: The kind of relationship which was there ten years ago is not happening today. We see that, in many projects, the builder dominates, in some projects the owner dominates and in some projects the architect dominates. Ideally, no one should dominate. It should be a scenario where there is a collaborative effort between the three people. Only then the best of the lot really happens.
K. Jaisim: The growth of the space and the growth of the final form is a subtle growth of interaction between the client, the space, the builder, the architect and everybody else.
Tony Kunnel George: There obviously is a dichotomy and most of it has to do with greed. It's very greed-driven. When I use the word greed, it's again back to economics. If architects really understood economics they can explain to a client or can walk him through and say that it makes better economic sense to follow the rules than rather do that.
Sudheendhra Yalavigi: But I think the design begins not with the money. Design begins at a more abstract level. Money comes in a little later. If the design has been developed to a certain extent where it can be sold as an idea people will find the money for it.
Arun Balan: Today I think it's mostly a client-driven practice or it is more about numbers and it's more about - how much for less.
Hareesh Asnani: Respect for the architect is a little bit on the downside. The ideal situation is you would go to an architect because you have seen his work, you like what he's done, and you'd go to him. "I want you to do the work." I think it's the other way around where the architect is going to the client.
Sudheendhra Yalavigi: Practice is always client-driven. Academic work is always conceptually driven. But there has to be a mix between both. We have, as a community of architects not been able to tell the clients or even convince them [of] the idea that design which is conceptually driven can give them a better environment.
Anil Dube: I am a very user-friendly architect. I'd like to give to a client not what I want, but what he wants. So my duty as an architect is always to try and translate his thoughts and his style of living into a building form. Whatever buildings I have done, each one is different from the other because it is related more to the client than to me.
Janardhan Reddy: I think it's more important to understand, first of all, what a client wants, and when you look into your various parameters which you have set - all these like site contexts, edge conditions, city, what happens to [the] street, public, society. I think those issues come later. First of all, it is the client.
Anup Naik: Most homes become an interpretation of the end-user. The architect is just realizing the client's dreams. He's just a platform for that.
Nisha Mathew-Ghosh: But I think you have to keep the clients' agenda at bay while you're working on the design. Sometimes, because, that can otherwise sound like a death knell for the project. Because their agenda is always so pressing, in terms of time. Sometimes you need to fend that away for a while. It's always a struggle, though, in retrospect you, kind of, put it nicely. It's always an agonizing struggle to resolve these.
Kiran Venkatesh: As an office we have always taken the stand that we are very upfront with the client, saying, put all the constraints on the table. We will negotiate and agree on a set of parameters - be it cost, be it area, whatever it is, and then you respect us for what we develop based on those forces.
Ravindra Kumar: There have been so many instances where a client's communication has helped us to understand what should be right for him or wrong and I always call that being a collaborator.
Rajmohan Shetty: The Case Study Houses. There it is when the program begins to provoke the architecture through speculation. So you begin to write and say okay, you are going through a really crucial moment that never existed, which is the post-war period, the baby boom, etc., in the US. And John Entenza, the editor of a magazine, Arts and Architecture magazine, takes it upon himself to pose this question to twenty-six architects: Speculate on the house of the future. He goes the whole shebang - buys the sites, gives it to each of the architects. Speculate. It does make a difference - it shifts. But John Entenza didn't go about saying, "I am going to build twenty-seven iconic houses." He said, think, what is it? So it was up to the architects to re-frame the program that was given to them according to his or her areas of interest. That, in hindsight, one could say, does come close to some sort of iconic status. A paradigm shift, another way of thinking.
Arun Balan: Today I think people are getting a little more sensitive to this whole issue of expression and so they don't mind if they lose out a bit of FAR. They are quite happy saying we do stylish buildings. Each one of them, mostly youngsters, all of them say we want something very different. Almost on all the projects, people are always asking for something different. They don't want the regular car porch, or regular staircases, they want to do a lot of things today. I think it's great. It's also because people are well-travelled and they are exposed to several cultures, and there is the TV.
K. Jaisim: These people, absolutely no idea what architecture is, they've got a shopping list. You happen to be one more shop. In fact, the way they come and question me saying will you do this, will you do that? I smile and say "You came through a door, there's a door to go out."
Sanjay Mohe: As long as there's a civilization, there's going to be this conflict between the Classical and the Popular. It's not necessary that the Classical is going to be liked by everybody. That distinction will always stay.
Ranjit Naik: In our country, one of the things which are available abundantly and free of cost is advice.
Satish Naik: There are a few individuals with whom I have enjoyed working because they behave exactly like if you were dealing with a company. Because of the faith.
J. Sandeep: If somebody is sensitive, most of the other factors are taken care of because your agenda is not about catering to a client or to a system but finally being sensitive to the place and making an appropriate kind of structure.
Manoj Ladhadh: There are lots of things that are behind the scene which the client need not know. It's not important that he should know, but it's your hidden agenda that you cover, as part of your focus. Every time we have met a client, or new people, we have said that for us the ultimate is the project, I will overrule myself and you in the interest of the project.
Anup Naik: You are always looking in a different direction. You don't need to tell the client that, that I am doing this for my professional gratification. I am doing it because he thinks it's a good idea and you are continuing, but you are actually developing a different system altogether. It might take one project, two projects, or three projects but we are actually using that base as an R&D facility.
Soumitro Ghosh: Any creative individual has, definitely, a personal agenda which is actually what keeps them going. If it is not there then they are dead. They are just doing what is told to them and then they are not bringing anything more than a service, so to say.
Anil Dube: Not only with builders, with clients also you try to bring in your agenda, but not force it on him.
P.K. Venkataramanan: Persuasive powers are absolutely necessary for an architect and he has to acquire this skill. This is not taught to him in any school. That's why lots of youngsters who are jumping into the profession, they think they already know everything. You cannot say, "this or nothing else, either you take my design or…" It's a dialogue.
K. Jaisim: Developers are very important to the growth of a city. They could, in fact, if properly understood and they understand, be the biggest engines of great growth. But they must get away from the grabbing factor.
V. Narasimhan: Architects have to learn to work with developers. Developers are the true planners of the city in the absence of a planning mechanism.
P.K. Venkataramanan: He said, "If you do a builder building it is prostitution." I was shocked actually. I said, "How can you say this, because, whether you like it or not the city is going to be full of such buildings. This is the reality, if you want to save the reality, you better get involved in that process."
Kiran Venkatesh: I think developers are really setting the tone, so one has to see whether you can get them onto a forum and actually address an issue where you say, "Look, you guys are actually helping shape the city, can you do more?" How does the developer give back something to the city, which is just not better amenities for the people who live in that apartment unit or who use that public building? So I think, if that dialogue can be set at some forum between the architects and developers, then you've got to go to the government with a proposal saying if there is a commercial building in the CBD, or in these areas, and it does 1, 2 and 3, give up some part of its areas, it could be either parking, it could be public amenities, it could be space, it could be the creation of something as simple as an auditorium. If you do A for the public environment or the public space, then you get these rewards. You have to incentivize this.
Arunjot Singh Bhalla: The developer is also governed by the commercial end of things, they also want to do it quickly. So now you have a number of people who want it faster and faster. They are willing to spend more, they want to de-shutter faster, they want to cast faster. When they are doing these kinds of things, the pressure is coming onto the poor designer who is supposed to put something that meets the requirement of the client, the client's clients and the speed requirement.
P.K. Venkataramanan: They don't have time. They say in six months we have to move in and they say, "Either you deliver or we go somewhere else." There will definitely be a compromise on quality, because of compressed time, it's possible. I won't say it's possible, it always will be the case actually.
Edgar Demello: The patron is the builder. We are facing this thing day in and day out. We are doing almost no builder work. We used to do it earlier and we gave up because we produced rubbish, I could say myself, because we got caught up in that vortex and we said we can't go on like this. Now you're fighting all the time because there is a 'language' or a 'non-language' that has been established that's a quick fix. And people love a quick fix.
Soumitro Ghosh: It's like a B-Grade Bollywood film, you know. It's like, yeh daal de, yeh daal de, it'll work. They don't want to think more than that. Why should they? They're making 'x' amount of money. He'll tell you directly, "Dimag nahi kharaab karne ka, you don't have to do all this. I want it fast. Put these few elements, we're done."

04. MONEY: Are we compensated enough?

Anil Dube: I think if we follow the professional fee structure you are paid well.
Tony Kunnel George: Simple things like ethics of practice. The COA says do not drop your fee below 4%. It's difficult when the rest of the architectural practices are saying, well, we are willing to drop to any level.
Ranjit Naik: Undercutting is there, but I guess undercutting is a part of any industry. Of course, it's not a professional thing
Prem Chandavarkar: I wouldn't depend on any institutional protection like some mandatory scale of fees, like what the institute [IIA] or the council [COA] have tried to do. I think each of us needs to think about differentiation so that we are not just like any other architect.
Manu (S): I have no regrets, absolutely no regrets, about taking up this profession because it has opened my mind so much. It made me think about so many things. We are so much more sensitive than engineers, doctors and lawyers, even though they are getting paid twenty times the amount we are.
Ranjit (S): You are not doing it purely for money.
Sathya Prakash Varanashi: This profession is not merely a means to earn money. There are other means as well. It's also a means to look at our own selves.
Bimal (S): The problem is that when you do the only good design you don't make that much money and you have to eat.
Anil Dube: It's a different profession. Then don't do architecture. If you do architecture then you do it for its cause, and for your personal level of satisfaction, and to educate people around you - this is how you should live, this

is how your house should be. You have to lose something to gain something.
Manu (S): I think it's a tragedy. Architects right now, are a crippled profession in the city. You actually find them struggling to make ends meet. I am not talking about people you know, I am not talking about Anil Dube, I am not talking about Sandeep, I am not talking about Mr. Bijoy, but I am talking about other architects in the city.
Anil Dube: And they expect money. I would have worked for free in my time, that's the way we were taught.
Tharunya (S): It's not tangible and lots of people think, so what, I can do this myself - I can figure out what needs to go where, I can figure out how to make my home look the best, or my building look the best.
Prem Chandavarkar: Most architects run their practices very inefficiently. They don't look at the difference between the percentage [of the] completion of the project and the percentage of the fee paid, so they leave large amounts of money untapped, which they don't even collect. So therefore they are driven to survive at a subsistence level whereas they need not.

05. DEVELOPMENT PLANS: And impact on the city form/ involvement of the community

J. Sandeep: I wouldn't say it's a good manual, probably you are relating only to the numbers and the numbers are worked out really well, but as far as city form and the other issues are concerned, it's direly lacking.
Nagaraj Vastarey: The city planners, I really wonder, how they work. It's always a two-dimensional thing, and byelaws would mean what? Just to satisfy numbers.
Kiran Venkatesh: what you need to really worry about [in] the CDB is that it doesn't have a comprehensive transport management plan, or a traffic management plan for the entire city, it doesn't address that issue.
Janardhan Reddy: I don't think they suit our city and our conditions.
Soumitro Ghosh: At the moment whatever bylaws are active, they do not reflect in any way, where it's achieving any of the goals that it sets out for itself.
Anil Dube: Let's just build on FAR and coverage and leave the setbacks to the individual, with some sort of thought that he would like to give to his neighbour for light, air and ventilation. I think out of sheer respect for each other, those things will start happening.
Arun Balan: You can't expect the same FAR that is applicable twenty kilometres from the CBD applying in the CBD. Not happening. I personally feel that you need to segregate zones, you need to allocate commercial, residential, service zones, and recreation zones, everything has to be separated out from one another.
Kiran Venkatesh: It's a very exciting idea of integrating multiple uses. Its rather boring to have only housing tucked away, put a circle there, put another circle and say this is commercial. It is nice to integrate it, but the integration comes at a huge cost of traffic becoming chaotic. And traffic and parking that's the issue which needs to be balanced with this hybrid or mixed programming that the new CDP is envisioning.
Nisha Mathew-Ghosh: Somewhere the government has stumbled badly in providing the right vision, beyond its immediate political gain - which is a much wider vision for the people.
Akhtar Nagaria: He's investing so much in land cost, which is changing everyday, its becoming difficult for him to buy land at the price that he decided yesterday. Apart from buying land and setting up infrastructure, he has to think about running his own business. So is it fair for us to ask the software developers that he has to worry about it at the city level also? It's something that somebody else should be doing for him.
Edgar Demello: Today what do you see? You see somebody dissatisfied with roads, so they come and build a road. Somebody dissatisfied, he can't get there on time, so they come and build a fly-over. So it's all I, me, mine, it's not ours. So now if you really talk about housing, do these stakeholders really look at the larger good?
K. Jaisim: I don't think anybody, even the politicians, the people in the bureaucracy, the decision-makers even have a clue what this city's direction is. If some influential people say there should be a flyover, there's a flyover. If some of the big business magnates say we need a big super expressway to us, there is an expressway. These are like children shopping in a chocolate shop.
Anil Dube: I find these people thrown into the papers daily making some remark or the other about - we should do this, we should have that, but they don't go to the technically sound people. And there is a handful of people in Bangalore who are the authority on everything, whether it comes to roads, whether it comes to building, whether it comes to IT, whether it comes to shit pots, name it and they are the final word.
V. Narasimhan: The government actually has not recruited any planners since the mid-eighties.
Soumitro Ghosh: A lot of governments work with private consultants to prepare specialized reports, which are not their cup of tea. You need experts in a certain field. Now what it means, in addition, is that you cannot sit back and assume that the particular consultant will not make any mistakes or cannot be given more feedback from your own experience on the ground and I think, there should be a separate set of people, important minds of the city, who need to question the CDP before it is activated.
Prem Chandavarkar: We have no tradition of urban design. We have master plans which are two-dimensional, formulaic entities, which just construct like…that's one thing that even the current master plan has not broken any new ground on. It reduces the city to a mathematical set of formulae which are applied uniformly across the city. Whereas Urban Design would look at each specific geographical location within the city… as how do you construct a sense of neighbourhood, how do you construct a sense of scale. And she [Jane Jacobs] says that the city develops a culture out of an intense network of street-level pedestrian contacts and she says that contemporary town planning schemes tend to devalue that. They look at the city as a machine, they don't look at the intensity of street-level contacts. So the city has survived culturally in spite of town planning and not because of town planning.
Tony Kunnel George: Remove boundary fabric, so buildings then begin to be part of an urban structure. Here still every building has a compound wall. Remove barriers; create interactive movement, and let people move through the buildings
Ravindra Kumar: We are not dilapidated. If Bombay is surviving, we have another thirty years to become Bombay and another fifty years to still fall apart to become Siwan in Bihar. And we'll never learn. I am sorry, I think I am being very cynical, but this is what the imperialists left with us. It's a huge population of corrupt minds.
Nagaraj Vastarey: I am certainly not optimistic. If I have to think about a solution for this: one thing is the civic authorities should involve people from various walks of life.
H.C. Thimmaiah: They should have involved a bigger forum of professionals, not just architects and planners. It needs a lot of people, different kinds of people, even a person on the street, a vendor, he will contribute a lot of things.
Anup Naik: We have a foreign company who is actually planning for the city, is that necessary at all? How much of Indian input is there in that? In their tenure of one year or two years in the city, is it valid at all that they are giving you directions for your own city?
Nagaraj Vastarey: One generally talks of decentralization. There is a tremendous need today to develop district nodes rather than working on Bangalore alone.
Sanjay Mohe: And the way the whole growth is happening, it's so chaotic. Ideally it has to be decentralized.
Ranjit Naik: You'll are talking about increasing density in already dense areas like Chickpet, Avenue Road, you are talking about zero setbacks, FARs of 3 and 4. This is going to lead to, in simple terms, immense pressure on the infrastructure.
Akhtar Nagaria: 60% of the software guys who come into Bangalore get on to Whitefield. If you're not going to allow for that 60% to be staying there, you've lost it. To allow that you need higher FAR, to allow that FAR there are so many things.
Hareesh. Asnani: Infrastructure has to cope with that density.
Manoj Ladhad: Between the past CDP and the new CDP, a large amount of it is a documentation of what the current trend is and they say that the current trend is fine, let's go ahead with it. And then you are trying to patch up with the infrastructure, services, etc. That's not the overall picture. It needs to be looked at in a wholistic way.
Sudheendra Yalavigi: Although we may have any grouse against the zoning and the byelaws, in terms of their not being formed properly, our responsibility is that we first follow it.
Anup Naik: Ideally we should look at respecting the law of the land. It doesn't matter what it is.
H.C. Thimmaiah: There's no point in going on blaming the byelaws. The byelaws are required. A guideline is required and we are provided with one. If certain items are very strongly objected to, they can be raised, and I am sure the authorities will concede and make amendments.
Prem Chandavarkar: I think you have to stay within the law even if you believe that the law doesn't make sense sometimes.
Nisha Mathew-Ghosh: We have taken a stand to basically go by the rules of the profession and not to flout it.
Soumitro Ghosh: But I think you should add that we have not worked with developers so its very easy for us to say it (laughs).
Bimal (S): You'll go out to the road over there and say, this guy has built on the compound wall. That's fully because of the architect. It's your duty, as an architect, to tell the client that this cannot be done.
Akthar Nagaria: The architects need to be quasi-policemen on the project. You need to be able to direct either the project or the client to get him to do the right thing.
J. Sandeep: And finally it doesn't answer the needs of the city. Maybe you do a one lakh twenty [thousand square feet] in a sixty thousand square feet plot where the FAR is probably one, but at the end of the day, you have to answer the other things - the infrastructure needs, etc. So I think at the back of our minds we consciously are saying no, we don't want to go beyond a certain point We know our limitations and we work within that.
Manu (S): You said you would carry a project out to 95% and even if they tell you to break one byelaw you're going to quit. I think that's ridiculous.
Tharunya (S): You shouldn't stick to your principles to such an extent.
Sushir (S): You shouldn't?
Bimal (S): I think it's highly personal. If he wants to quit he quits. If you want to break the bylaws for some reason, it's fine. It's your way of thinking, but it doesn't mean I have to agree.
Ranjit Naik: On the one hand you have your responsibilities as an architect and as a citizen and on the other hand you have to feed your stomach. Ethics come into the picture. Individual ethics.
P K Venkataramanan: Ultimately every architect draws his own line, the line is the lakshman rekha which he will not cross. I will go this far and no further. The individual architect will have to draw his own line. If you say, I am not going to compromise on anything, I will stand on my principles and I will practice architecture, or any other business for that matter, I do not know how far you will go.
Nagaraj Vastarey: In terms of practice I have accepted that the violation is there and it has to be accommodated. But how tastefully can you do it?
Hareesh Asnani: We as professionals should not endorse any kind of violation. Full stop. And it's not even a question of us saying, I will give you the drawings, you build it, I don't care, no. We should not be involved in any of that, at all.
K. Jaisim: Okay which means do you want hard regulation? That would be disastrous. No single man can give, on a bureaucratic level, the overall direction and say this is what you do. It's impossible. We are not kings here, we are a democracy. It has to work through a process. But responsibility with that authority must come.
Manu (S): Abroad you have an informed panel of jurors who decide what a building is doing to the city, and they allow the bending of the byelaws for another reason right? That's what I am talking about.
Sushir (S): But you just said you were talking about the Indian context.
Manu (S): In the Indian context it's your responsibility to be sensitive and informed. See by saying this I am not giving license to anyone who breaks the law.
Sushir (S): Excuse me you are.
Manu (S): They already have it.
Kiran Venkatesh: What continues to be lacking is an enforcement idea of the byelaws. Currently the byelaw is a guideline which says you do A, B, C. You get a sanction as per that and you build D, there is no system which says you have not followed A, B, C, hence you cannot occupy or there is this huge damage you incur.
V. Narasimhan: There is really no enforcement culture in terms of bylaws except in a sporadic sort of way. I wouldn't say all of it is a mess, maybe 60%, 70% is still within the law. Most south Indians at least are law-abiding.
Anil Dube: It was also a non-governmental body where an architect would sit and where a town-planner would be there and a corporation guy would be there. These people would

go through the drawing and discuss it, not individually but on a table, so it became like an iteration and the attitude was very positive - to help the client to build his structure.

P.K. Venkataramanan: It's an absolute pity that we are not a part of that thing.

Edgar Demello: The closest that one came to this was when BATF was set up by the previous government and they had people on the panel, they had an architect…They also brought in architects to do some of the work. But I think at some level there wasn't any vision.

Sudheendhra Yalavigi: Probably create a forum in which we as architects can represent to the people who are forming this development and offer an alternative wherein they can achieve the same goals by different means.

Ranjit Naik: As a part of PAA, when we had these interactions with the BMP, everything had already been decided. This was just a formality, an eyewash. Just to show that, okay we have been interacting with all these architects, town planners and the Institute of Engineers.

Satish Naik: When you call the team of architects to give suggestions on the development of the city, at least a minimum of 50% should be accepted.

Anup Naik: You need a political voice for this. The reality is that. As architects, as planners, politics is a reality. I think we need a political voice, without that things won't work. Otherwise, it's all good - written, documented and that's the end of the story.

Prem Chandravarkar: I think these things start with small beginnings. It perhaps just could be six architects in the city getting together and saying let's share ideas about our work, let's share propositions about how our work is making the city. And then those architects come together in a forum and try to raise a voice in the public domain, perhaps writing articles in the newspaper.

Sanjay Mohe: Attempts have been made by professionals and people who are really serious about this. But probably the commercial pressures are so high, that as an architect or even a group of architects you cannot fight those pressures.

Anil Dube: I think it's also partially our fault. We don't come forward and sound to the authorities that, look, we are there.

HC Thimmaiah: The professionals should also get involved. They should not wait for an invitation as such.

Rajmohan Shetty: There's absolute apathy from the side of the profession. They are ill interested in what the city means, and for good reason, you never find them on any board that contemplates policies and city-making. So we really find ourselves absolutely marginalized because of our own doing.

Edgar Demello: I think it has to do with an architect's inability to voice dissent. He's just unable to do it. He is caught up with this, in more ways than one, a rather servile sort of attitude to government.

Ravindra Kumar: The architectural community has got to learn to come together. Half the time it's just that nobody has the time to come and do it right. But that consciousness has to come through.

J. Sandeep: The law of averages will catch up with the city. It is not going to be one-sided any more time. There is an undercurrent that there has to be a more conscious and holistic approach to the planning, and outlook of the city itself.

Janardhan Reddy: I think the state has a major role to play in this. I think this is a move that should first come from them.

Edgar Demello: But there is really no will. There is no political will.

K. Jaisim: For over thirty years I have been involved with various government authorities. I don't think the Indian government is serious - I think they are just there.

Ravindra Kumar: I think finally the political system is very important. If in New York, to take an example, if Times Square were to change drastically over a period, whether it the community of people, a community of non-profit groups, or the architectural community cannot do that, at that urban level. You need the conscious government, you need the conscious coming together of various groups of people to support that possibility. A bunch of sensible people have to get together to do sensible things.

Collaborators:

Anjali Kondur Menon, My daughter | K.S. Ananthakrishna, RV School of Architecture | Hareesh Asnani, Space Matrix | Arun Balan, The Bodhi Tree | Arunjot Singh Bhalla, RSP Architects | Prem Chandavarkar, Chandavarkar & Thacker | Edgar Demello, Edgar Demello Associates | Anil Dube, Anil Dube Architect | Tony Kunnel George, Atelier d'Arts & Architecture | Nisha Mathew-Ghosh, Mathew & Ghosh Architects | Soumitro Ghosh, Mathew & Ghosh Architects | K. Jaisim, Jaisim Fountainhead | Ravindra Kumar, Pragrup | Manoj Ladhad, Architecture Paradigm | Sanjay Mohe, Mindspace | Akthar Nagaria, Pro-Design | Anup Naik, In Antis | V Narasimhan, Venkataramanan Associates | Janardhan Reddy, Janardhan Reddy & Associates | J. Sandeep, Architecture Paradigm | Rajmohan Shetty, Rajmohan Shetty Architects | Kavya Thimmaiah, Thimmaiah & Prabhakar | H.C. Thimmaiah, Thimmaiah & Prabhakar | Sathya Prakash Varanashi, Sathya Consultants | Nagaraj Vastarey, Pragrup Amoorthsiti | P.K. Venkataramanan, Venkataramanan Associates | Kiran Venkatesh, In Form Architects | Sudheendra Yalavigi, RV School of Architecture | Tharunya Balan | Satish Naik| Ranjit Naik

Abbreviations:

BATF: Bangalore Agenda Task Force | **BMP:** Bangalore Mahanagara Palike | **CBD:** Central Business District | **CDP:** Comprehensive Development Plan | **COA:** Council of Architecture | **FAR:** Floor Area Ratio | **FSI:** Floor Space Index | **IIA:** Indian Institute of Architects | **PAA:** Practicing Architects Association | **(S):** Student

Transcribed by Meel Panchal & Sucharita Hazra

This Dialogue will be continued in the July issue.

Ar Bijoy Ramachandran founded Hundredhands in 2003 with his partner Sunitha Kondur, and currently serves as the Design Chair for the post-graduate program at BMS College of Architecture in Bengaluru. Ramachandran has a Master's degree in Architecture and Urbanism from the Massachusetts Institute of Technology and a Bachelor's degree from BMS College of Architecture; he has also attended the Glenn Murcutt masterclass in Sydney.In addition to practicing architecture, he has also produced two documentary films: one on the celebrated Indian architect Sri B.V. Doshi and also 'Architecture and the City: A Bangalore Perspective', on the topic of design practice in Bangalore.

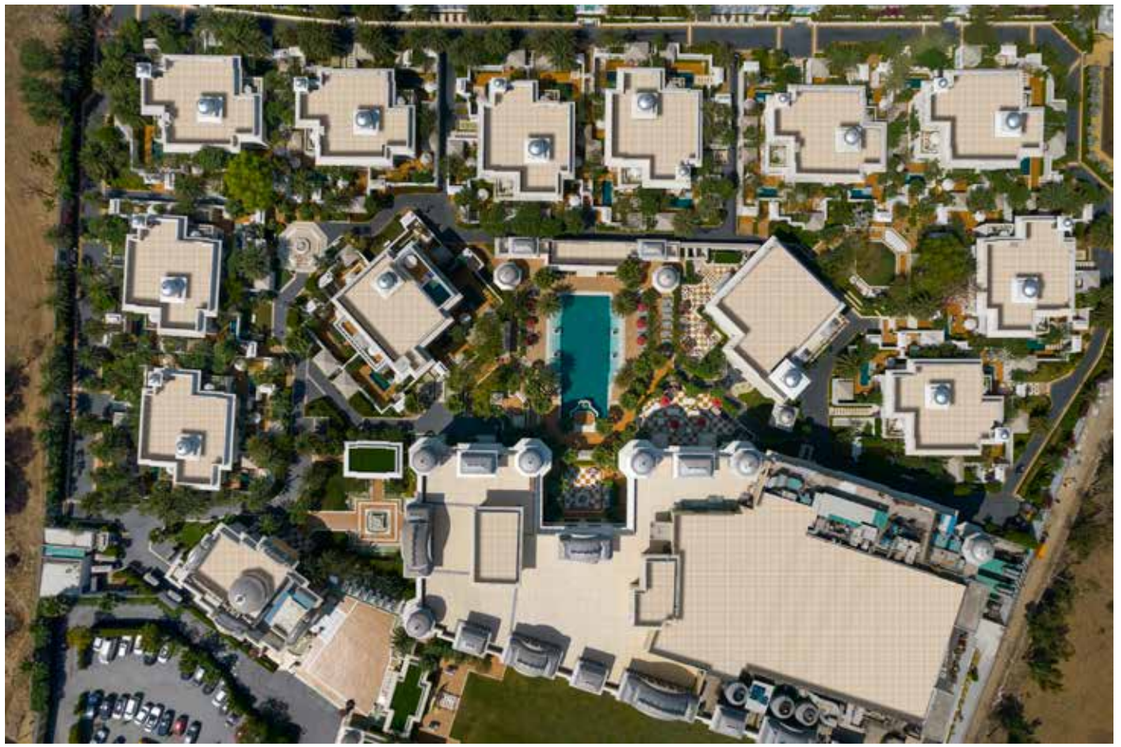
THE LEELA PALACE
JAIPUR, RAJASTHAN

Ar. Gyanendra Shekhawat

Fact File

Project Name	▶ The Leela Palace
Location	▶ Jaipur
Client Name	▶ Tulsi Palace Resorts Pvt. Ltd.
Site Area	▶ 30756 sqm
Built Area	▶ 23067 sqm
Completed	▶ 2017

Aerial view



The project reiterates the traditional architecture of the region and offers a perfect blend of classic design and contemporary flourishes. From the intricate *jaalis* to the ornate glass inlay work called *thikri,* to the enchanting architecture, the luxury resort gives its guests a glimpse of majestic Rajasthan.

The Design Principles

Design ideas of the past, encapsulated in a way to meet modern needs. Inspiration from the city of Jaipur is taken following the concept of a low-rise high density pattern of living. The fundamental thought to achieve the soul of the old with the adoption of modern needs and approach is achieved in this epitome of architecture. The core being significant, houses the character of the site. The Palace Block, surrounded by amenities and other features, resides in the centre of the site hosting multifarious aspects. Trailing from the design principles of the walled city of Jaipur, a series of courtyards formulated around the major blocks form an overall layout, while also accommodating a breakout element with pleasant surprises at every node. An interesting forecourt allows guests to enter and reach the Reception Block and the Palace Block on the other.

The natural surroundings of the Aravali hills vivify the experience of being in the lap of nature. The highlight of the building should be its architectural design features, expressing the rich heritage design discipline of the region. The use of natural and locally available stones and regional techniques emphasize sustainable solutions.

Vehicular movement, restricted until the Arrival Court, makes the pedestrian movement easy and restriction-free. The parking for the resort is at a required distance from the villas keeping them away from the hustle-bustle and creating private zones for the users. The internal circulation from the Palace Block to the villas is catered to using golf carts.

Constraints and solutions achieved

The constraint in the project was the harsh hot and dry climate. This solution was achieved by the efficient use of materials and natural ventilation through courtyard planning and adequate use of *jaalis* as facade treatment. The courtyards are planned in a manner that gives maximum shaded spaces and allows the best experience for the guests.

Special features

The basic design principles are balance, proportion, rhythm, emphasis and unity are expressed in the form of key elements: *chhatris, jaalis,* niches, *jharokhas,* arches and other ornamentation to accomplish desired results, giving it a majestic appeal.

Landscape

Landscape planning and envisioning effort to establish a land usage that connects users to nature and building. It allows the user to get past the urban life and revive the culture of experience of Jaipur's heritage.

All images courtesy: **IDEAS, Jaipur**

Swimming pool

Arrival plaza

Façade and outdoors

Facade

Courtyard

The Court leading to Reception

Front facade

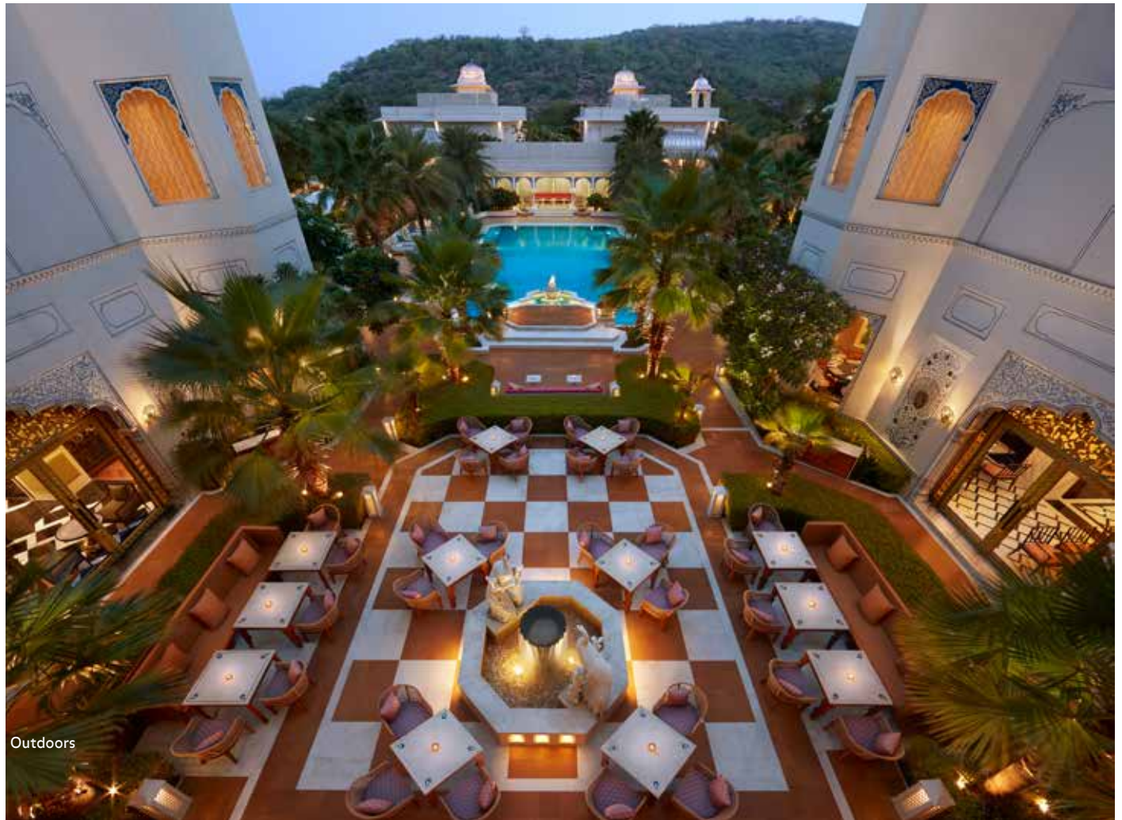
Private courtyard

Pathways

Private courtyard

Pathways

Junctions



Outdoors

Night View

The Skyline

IDEAS
Ar Gyanendra Singh Shekhawat is a well-known Indian architect with 25 years of professional experience in the field of Architecture and Urban Planning. Ar Shekhawat has been meticulously drafting the Urban Life with his conceptions & years of experience in building design and immaculate knowhow of regulation which have helped him create some of the prominent Urban landmarks across various cities.
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SAPTHA RESORT AND SPA, WAYANAD

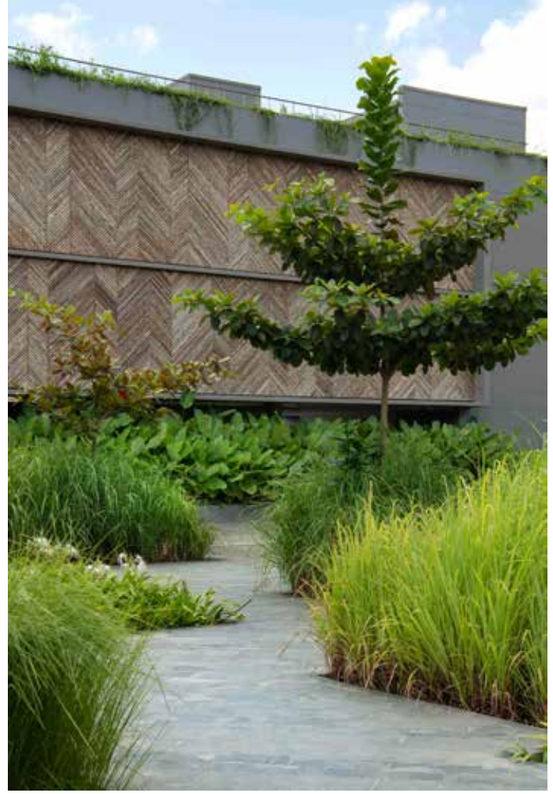
Stapati

Entry Porch

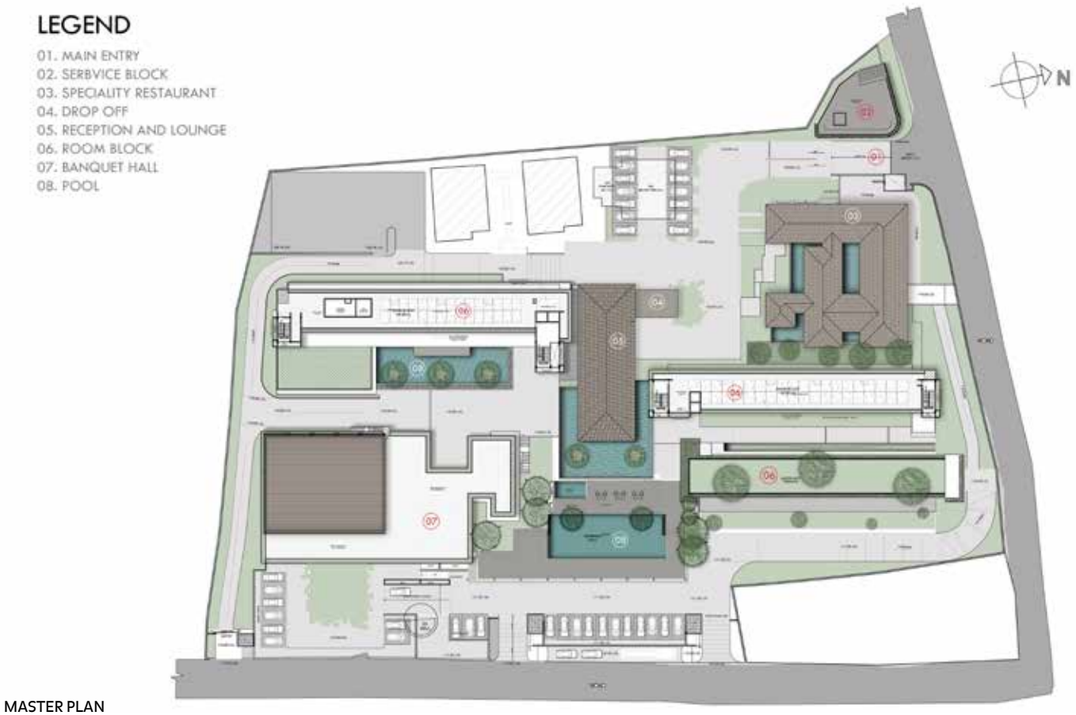
Existing development in Wayanad with a steep terrain adjoining paddy fields towards its south-east direction forms the site. The design evolved as a response to the topography of the site: the need for orienting spaces to harness the wind as well as opening up spaces to the beautiful views of the paddy fields. The rustic aesthetic for the resort was achieved by blending the vernacular materials used by Wayanad's indigenous communities, with a mix of contemporary styles of architecture. There is an interplay of built and open volumes, with courtyards and waterbodies welcoming nature into the design. The timeless minimalistic design allows the guests to disconnect in repose away from the hustle and bustle of the city.

The access road along the site frontage gives the visitor a panoramic view of the resort, which then winds up the north-east end of the site. The main entry sits uphill and leads to the reception lobby and the speciality restaurant. A separate entrance allows access to the state-of-the-art convention centre of the resort.

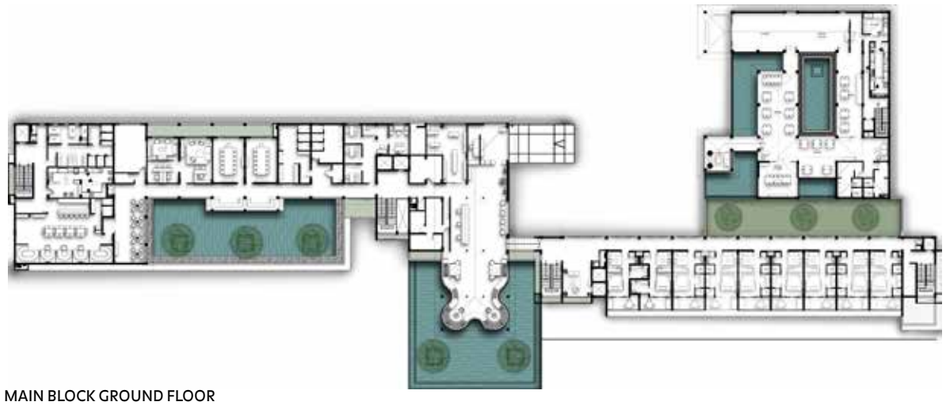
With a maximum height restriction of 10 meters, zoning the various functions along the slope was a major challenge. The hierarchy of the functions was defined by the requisite for separate access to different spaces as well as privacy factors. The linear arrangement of the blocks ensures an undisrupted view of the fields and the hills beyond, from each unit. The speciality restaurant was strategically placed close to the entry to facilitate easy access for the non-residents. The reception lobby sits equidistant from every block at the centre of the site.



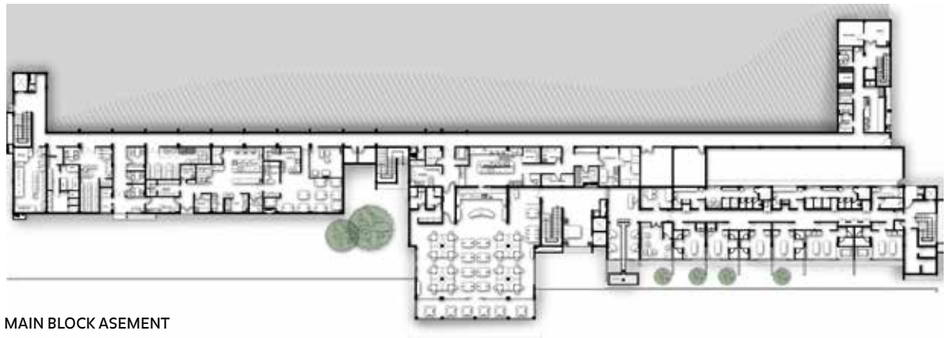
Main block



MASTER PLAN



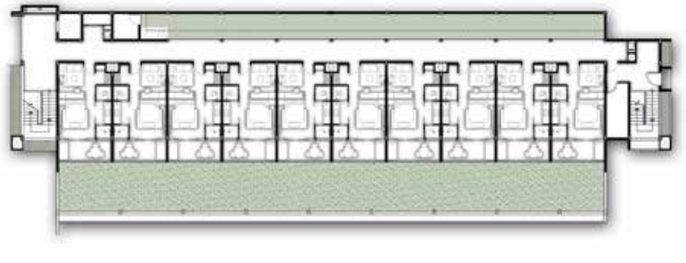
MAIN BLOCK GROUND FLOOR



MAIN BLOCK ASEMENT

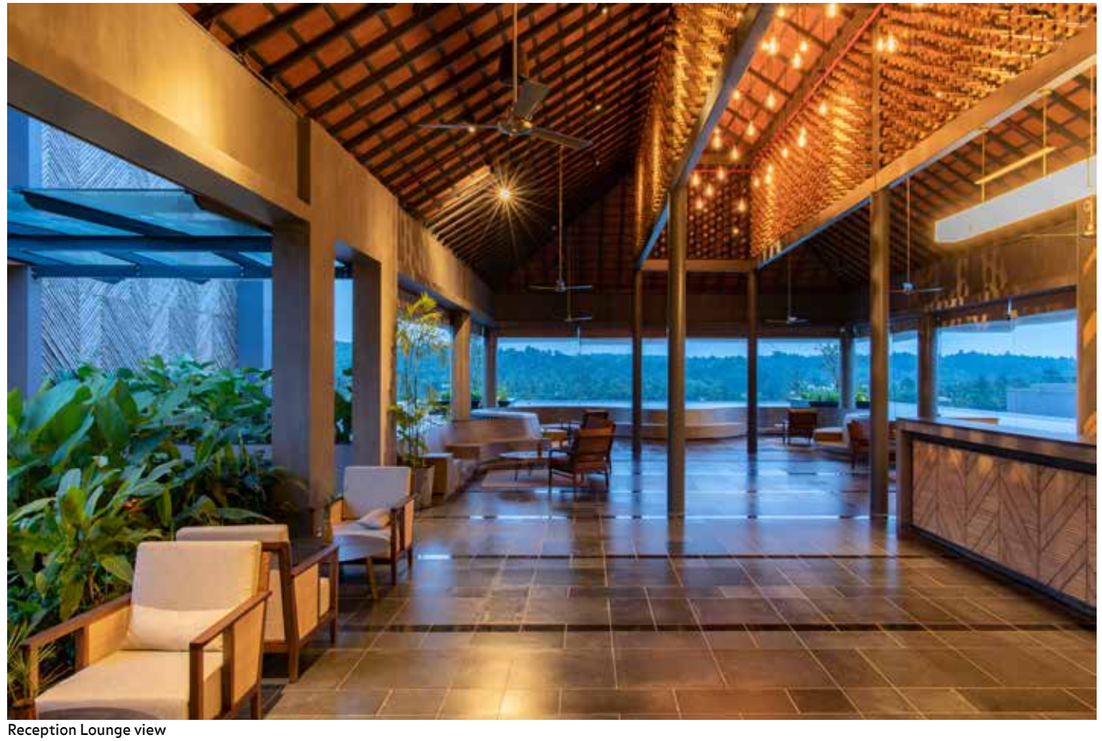
MAIN RESTAURANT

CONFERENCE GROUND FLOOR



ROOM BLOCK

Main Restaurant view



Reception Lounge view

Reception

Room Block

Speciality Restaurant view

Suite Room Deck

Suite Room

View of the Main Block

View of the speciality restaurant

The planting is done in an informal pattern, creating an interesting design of contrasting foliage, texture and colour. It is designed as a series of spaces, responding to the built volume and allowing a variety of landscape experiences, and layers of vision. Resonating with the design, the space exudes warmth through the colour palette, which is a combination of subtle colours that are contrasted with the rich tones of wood, the dark stone flooring and the ever-present green.

The project is complete with a material palette that reflects the lifestyle of the indigenous tribal groups of Wayanad. Bamboo, elements of areca nut palm, natural stone, timber and the local species of flora used for landscaping, all contribute to the warm luxurious ambience of the resort.

The local community of Wayanad plays an active role in the functioning of the resort. Members of the community have been specially trained to perform various roles throughout the site.

All images courtesy: **M/s Stapati**

Tony Joseph

Mohandas

Harish M

Poonam Noufal

Stapati is an architecture practice established by Tony Joseph in 1989. Tony graduated from MIT Manipal and completed his masters in design from the University of Texas, Austin, in the Charles Moore program. He returned to India and started Stapati, which has steadily grown into a multi-disciplinary practice emphasizing values of integrity, sustainability and innovation. Under Tony's able leadership has won numerous awards and recognitions over the years and has been selected as one of the Top 100 Most influential design firms in South Asia by Architectural Digest for eight years continuously, from 2014 to 2021. Tony is also the Founder Chairman of Avani Institute of Design, a Center of Excellence in Architecture and Design education located in Calicut.
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MERLIN OIKYO EXPERIENCE CENTRE (UTHONBARI)

Square

Fact File

Location	▶ Baruipur
Built up Area	▶ 736.64 sq.m
Architecture and Interior Design	▶ Square
Structural Design	▶ SPA Consultants
PHE Design	▶ The Archist Building Design Studio
Electrical Design	▶ Tapan Mukherjee
Landscape Design	▶ Layers Design Studio
Photography	▶ Sejal Agarwal, Nilanjan Karmakar,Square

Lawn and the entry lobby

Background

With the ever-increasing urban population in and around Kolkata, the pressure of mass housing in the suburban areas around the metropolitan is also increasing. The project *Oikyo* (unity in Bengali) developed by the Merlin Group is one such condo-ville with an array of G + 4 buildings for Bengali middle-class households. Situated amidst the quaint town of Baruipur, the *Oikyo Experience Centre* looks to bring back the Colonial aura. The theme of the project was old Kolkata.

It was envisioned that the club would remain at the heart of the complex serving as a place of interaction, as well as hold social and cultural programs which are so essential in a Bengali lifestyle. The client required it to be an experience centre that would eventually be converted into a club for the housing society.

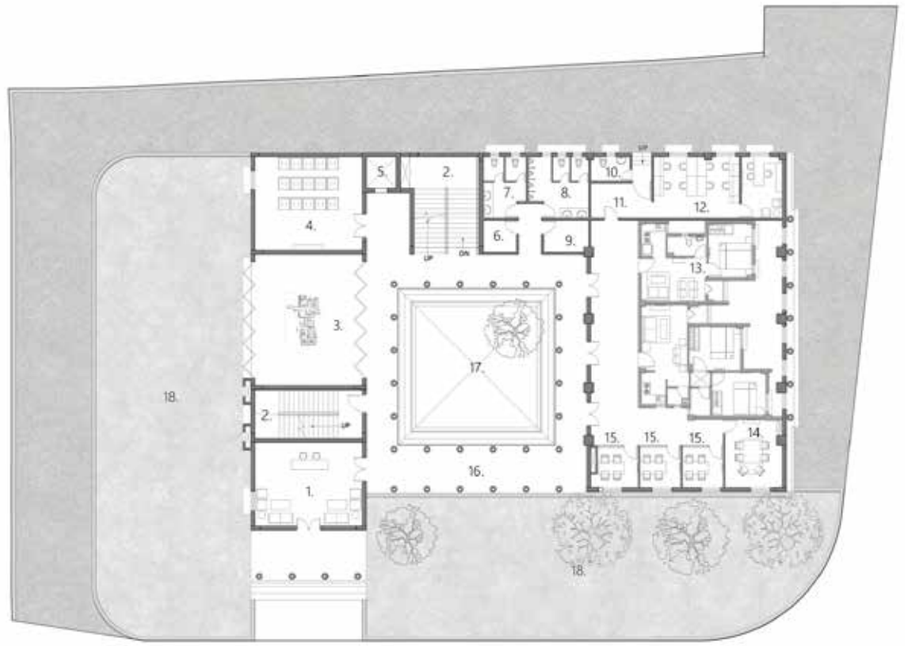
A tale of two buildings separated by time

Square was approached to take up the project of the experience centre. Immediately the colonial styles and space planning of the old Kolkata buildings triggered an idea. Normally experience centres tend to follow an ephemeral approach, mostly modern and creative. But in this case, it was felt a more permanent typology should be employed involving the nostalgic elements of architecture that so formed the heart of these old joint family houses. To achieve this, it was planned that the experience centre will outgrow itself as the club of the society undergoing a vertical extension.

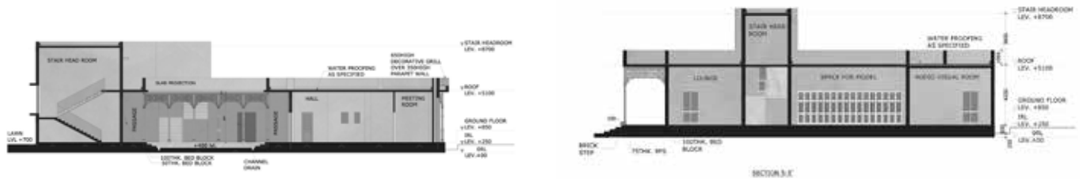
Perhaps the greatest challenge was to design the experience centre following its eventual transformation into the club for the project housing the banquet hall, games room, library and other facilities. Hence the array of spaces was designed keeping in mind their later use. Also, the present single-storey structure would get a vertical extension keeping the same design principles. The most interesting part of this project is the transformation of the spaces. The space which houses the show flats and meeting rooms will be converted into the community hall with the present back-office serving as the kitchen.

The model space area will open up into a lounge connected to the swimming pool with the AV room providing the necessary toilet and shower facilities. The central courtyard acts as the buffer space which sort of separates the club function with the community hall function during private parties but will eventually be the *thakur dalan* for the Durga Puja. It is also designed in such a way so as to hold outdoor functions with a fully openable sliding folding access to the lounge.

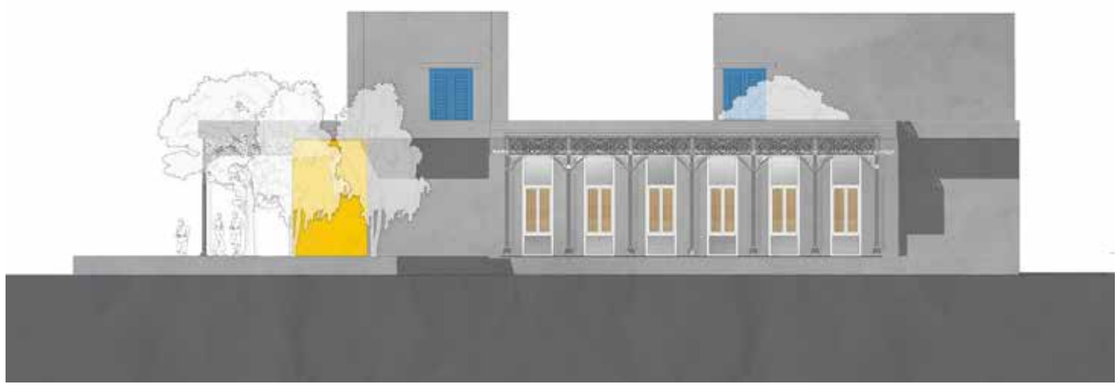
Front lawn



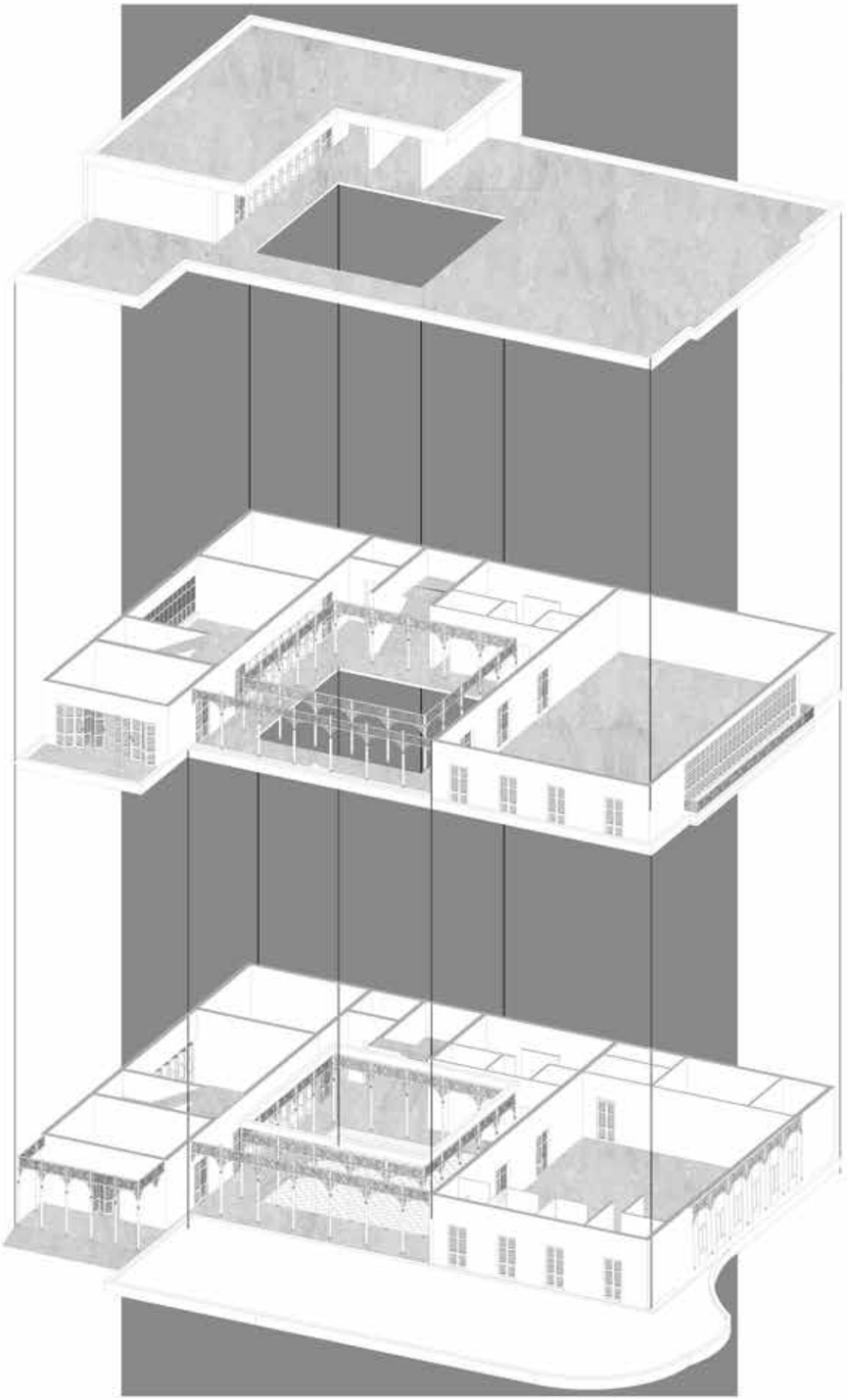
Ground floor plan



Section

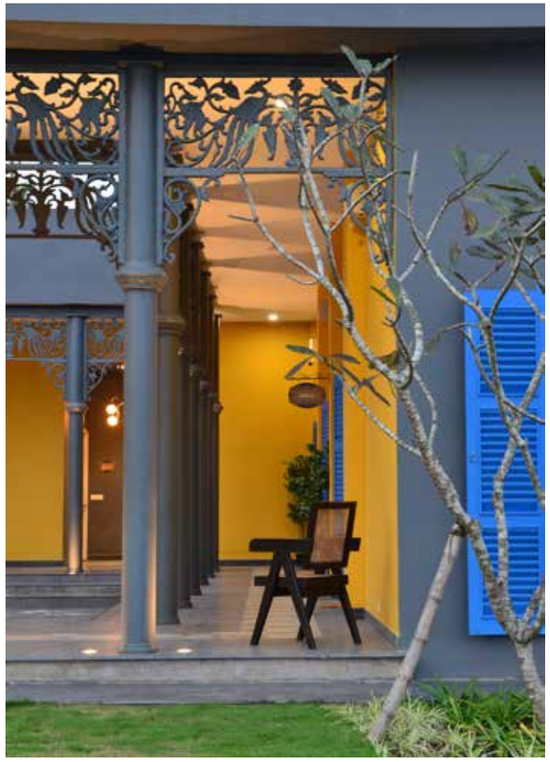


Side Elevation C



Isometric showing space allocation in different floors when converted to club

JUNE 2022



At Dusk

Complementary color scheme

Cast iron grilles casting shadows on wall

Covered arcade

Corridor from outside

Corrdidor from inside

Covered arcade

Door screen

Covered verandah

Modern color scheme

The first floor houses the library, gym and games room while the terrace uses an extended attic structure as yoga. Once the club is operational it will have elevator facilities.

Also, it was to be maintained that the building must look aesthetically pleasing when it was just a single storey as well as when it would become two and a half storeyed. So extreme care was taken in determining the proportions of the spaces.

The Built Form

The building centres on an *uthon or thakur dalan* or courtyard, which is the quintessential element of a Kolkata Colonial house flanked by shaded corridors. The corridor gives way to various spaces to be used for offices, exhibition areas etc. Another reminiscence of Colonial Kolkata was the cast iron grillwork. The flowing Art Nouveau designs were incorporated within the building. Extensive mock-ups and moulds were made up for the purpose and the single final mould was used to maintain the quality and consistency of the design. It also meant that the design had to use single-bay width all across the building. Although retro elements and designs were extensively used to portray the aura of the colonial style, care was taken to see that the architecture in 2022 should not just replicate a nineteenth-century structure, but look to create a fusion integrating the modern amenities. Thus, it followed an urbane colour scheme.

The usage of the buildings has changed dramatically and in modern days most of the interior spaces need to be air-conditioned. This is a major deviation from nineteenth-century mansions. Hence the use of fenestrations had to be dealt with accordingly. Various types of doors and windows were designed with different levels of lighting control, privacy and opening. Natural cane was used as an active element and this material could be found in the design of doors and windows as well as furniture and light fixture designs. Even the signage system was designed to go in sync with the overall theme.

All image credits : **Square Consultancy Services**

Ar. Ranit Maiti

Ar. Subhrajit.G.Mitra

Subhrajit G.Mitra and Ranit Maiti completed their graduation (2006) and post-graduation in Urban Design (2008) from Jadavpur University. They founded an architecture consultancy firm *Square* in September 2008. It is an architectural design consultancy which provides architectural, interior and landscape design solution to hospitality, corporate and commercial projects. With collaborative cooperation from experts in structural, MEP and graphic design Square looks to create an environment in which the designed spaces are structurally, functionally and aesthetically well served.
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STUDIO CHAUKHAT

A STORY OF AN UNTOLD VILLAGE

Ar. Shivani Dolas

Isometric illustration of the site showcases the overall arrangement of the cottages

The complex and ambiguous relationship between man and nature is central to Indian architecture.
Ar. Charles Correa.

In the outskirts of Gwalior, Dabra bypass, Madhya Pradesh, is a pioneering built structure of resort that is a study in design. "The relationship between built form, folks and public spaces never stops growing," says Kripal Singh Bhadouria as we discussed his first project as a team *Studio Chaukhat* of Imperial Golf Resort. When it comes to hospitality, you have to think of something different apart from what you do in your daily life. Keeping this the main concern for the design, the team started with a small scale of 4-5 cottages at the beginning, which eventually became the large-scale project of 38 cottages in total. Efforts have been made by the site's vendors, labourers and engineers. Most importantly, the client, Mr. Wadhva and Mr. Anshuman were always open to new experiments and *Studio Aagaur* for their valuable collaborations in the project.

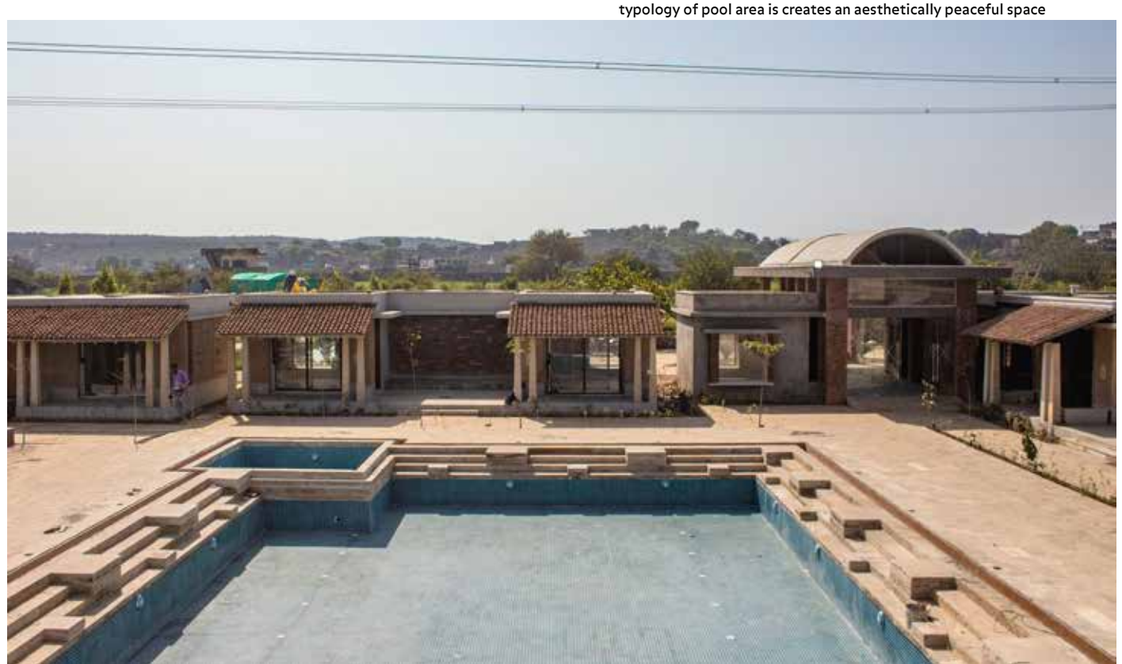
The vocabulary of the design was made keeping in mind the character of a hamlet. The setting of dwellings, public spaces in between the narrow streets with the interplay of fascinating traditional materials such as mud walls, exposed brickwork, stones, *khaprails* (country tiles) and many more. The challenge was to start the project at the beginning of the COVID crisis when the availability of resources, both labour and materials, were very limited. Indeed, which helped them to train the endeavours in a skilful way. As the matter of fact, this resort is no different from the combination of stories with blissful planning to dynamic material palettes.

A mindful blend of open spaces and built forms always occupies the heart of Ram and Kripal's practices. They have tried to keep the stories of the village as macro planning of the site, the main objective. The placement of the built forms for cottages has been divided into three phases ultimately evolving three courtyards from it. Narrow streets emerging into the big public space with trees and *chabutra* in the *aangan* (open to sky space) was the original concept. Therefore, the first courtyard on the site is the biggest, which incorporates the swimming pool and 14 cottage rooms around it. The second courtyard, which has a small *kund* with a tree, also covers 14 cottage rooms. The third courtyard is the smallest that has around 10 cottage rooms encircling it. The number plates of the cottages on the rammed earth walls are engraved on a single stone piece or *silbatta* which was carved by local artisans in Gwalior. The overall site looks like a small village settlement.

While the elevation of the entrance flaunts the minimalistic design approach, the inside area rather makes the aura versatile where one can enjoy the three roofing patterns. Filler slab over the reception area, brick jack arches, over the waiting area, and the huge *gauna* tube vault gives the unmissable visuals in the transition space when we enter the resort. The whole resort has its slopping section into the lake area, which is a natural contour on the site. The rainwater is collected in that lake which levels up the water level in the ground for the site.

In order to revive the village experience for the users, the team decided to create an informal public pool space taking reference from the historical Rajasthan's *bawdi* or *kund* (step well) in their design. This *kund*-type pool and sitting space create a traditional expression which stands out in the middle of the cottages all around. The 'kund's steps are wholly assembled with refurbished sandstone from the client's ancestral house, while the flooring around the pool area is laid with locally available sandstone in Gwalior. Here the sky is an intangible ceiling, spreading out across the entire dimension of the courtyard. "I always wanted an interactive space in my design in which users can sit and feel the aura and essence of the surroundings," says Kripal.

An overview of the swimming pool from the dining block. Here the kund typology of pool area is creates an aesthetically peaceful space



There are four typologies of cottages which vary in size, number of rooms and layouts. For a big family, the arrangement is such that, a living room with a small open area on the rear side and a verandah in the front. This living room, which has a built-in sofa with a pleasing yellow colour oxide, which runs to the floor, opens up into two rooms in the opposite direction that has its toilet attached to both individually. The other typologies have a unique common courtyard space with a featured wall made of stones imported from Shivpuri, and a tree between the two cottage rooms. Materials along with the built forms make the best rhythm to justify the design, says Ram.

The individual cottages have their own classic language. The structure is built on a load-bearing stone foundation. These sandstones were bought from a local mine in the Gwalior district. The excellent efficiency of the cottage design lies in its planning which assures maximum light and airflow in all of its rooms including toilets. As we enter the cottage, the space itself flows through the healing environment, which is the foremost consideration when it comes to hospitality especially projects like a resort. A cosy and comfortable verandah with stone columns in the elevation makes it an extension of the living area into the cottage.

Apart from the planning of the rooms, the rammed earth wall along with the Atangudi tiles (handmade tiles from Tamil Nadu) make the frame aesthetically alive. Mud for the rammed earth was extracted from the same site on which the resort is built which made the process sustainable. Ram and Kripal have had their experiences working with all these conventional sustainable materials during their professional practice in Auroville, Tamil Nadu. If we look into a particular space, toilets are the limelight character in the cottages. Terrazzo-coated bathtubs, planters above the face of an exposed brick wall, which is partly open to the sky, and oxide all over the walls create the aesthetics of the volume above extraordinary. I, as a viewer, loved the idea of acquainting not-so luxurious and massive rooms, where I could wake up as a user in the cottage walk in the light while having tea, sit on the verandah while looking out at the traditional community village-like set up in the front; enjoying the peaceful surrounding away from the city life.

The interesting features of the cottages are the roofs. One is the slopping *khaprail* roof over the wooden reclaimed beams in the verandah of the cottage to recall village aesthetics. This conventional design approach is practised in villages even today. These *khaprails* are handmade manufactured tiles by local Adivasi artisans of Shahganj region, Madhya Pradesh. Second, the shallow brick dome over the rooms gives a spectacular view while resting on the bed. Third, the brick vault covers the toilet chunk, which adds up grace to the existing area. The artisans from Haryana were extensively involved in completing a total of 38 domes and vaults over all the cottages.

One of the strong and attractive built forms is the two-floor RCC framed dining hall which has a kitchen on half ground and half on the basement with sittings on the first floor. It is at the highest contour on the site. The floor plan is a simple linear rectangular layout that outlooks the whole site area especially the swimming pool in the courtyard. To make the conscious decision on sustainable aspects of the hall, the

Combination of rammed earth wall, shallow dome, Atangudi tiles along with oxide finish, create a versatile material palette in the room

A playful shadow from the sun through the skylight in the bathroom

Living room with built-in furniture at terrace house

north facade, which overlooks the back area of the site, is covered with rammed earth walls with glass slits to pass the light into the indoor space. The south façade, which views the pool area, is treated with over-hung wooden roofs to ensure the minimum heat into the building and maximum visuals and light through the building fenestration over the site. The enclosure to this long-span framed structure is a massive wooden roof, which is dimensionally stable with a mesmerizing visual approach. This wood has been imported from a breaking shipyard in Alang town of Bhavnagar district, Gujrat, and installed by artisans from Rajasthan. There could have been no better sustainable option than using this already seasoned reclaimed wood for a large span structure.

Apart from hospitality, *Studio Chaukhat* has made the spaces sustainable and livable in another genre of the projects too. One such residential project is in the 'Alkapuri' area of Gwalior, Madhya Pradesh completed in January 2022. It is one BHK terrace house for Mr. and Mrs. Tomar on one of the apartment buildings. The idea was to create livable built spaces under the long brick vault covering the living and kitchen area; second the brick dome as a roof to the bedroom. With the same ideology as a resort, the indoor spaces are kept directly connected to the terrace through the large window to allow the light and airflow for thermal comfort. Some under-construction projects in Bandhavgarh and Bhopal is focusing on the minimum use of concrete in the building.

The team *Studio Chaukhat* has been raising the bar since 2019 for modern, eco-friendly, and sustainable design approaches with a wide range of material palettes along with upbringing skilled labourers and vendors.

All images courtesy: **Studio Chaukhat**

Studio Chaukhat
Ar. Shivani Dolas is an architect and writer who believes research and creative design together contribute a better architecture. She is ardent about sustainability in her field, which encourages her to explore more.
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ARTICLE

GOOD DESIGN

UNDERSTANDING THE ROLE OF EMBELLISHMENT IN THE ARCHITECTURAL DESIGN PROCESS

Ar. Asmita Raghuvanshy

What makes a ‘good design’ is a question that any aspiring architect has thought about, especially in their formative years. While various aspects of a design can make it valuable - like resolved plans, cohering with ergonomic standards and satisfying the clients’ spatial requirements, etc. there are more profound aspects of a design that give it value.

The scope of the architect's work goes beyond just creating functional spaces or engaging users in spaces that are created for certain functions. To state an example, when a client approaches an architect to build a house, the architect has the scope of not just planning a house satisfying the functional and spatial requirements, but also, creating a ‘home’ for the family. Through the medium of design, the architect can largely contribute to how a user may engage with space, and how a user may feel in a space.

Within an academic setting, architectural designs are evaluated by a jury (expert panel of evaluators). Most architecture competitions and architecture offices also use the system of juries for evaluating designs and to give designers feedback about their work. A jury functions by cross-questioning the designer and judges their ability to manifest ideas into usable spaces that effectively justify the presented design narrative. In such an evaluation system, the architect's design narrative towards a challenge is what forms the essence of their design solution.

Within the threshold of the profession, the designer's narrative can be easily explained using drawings, scaled models and spatial representations. However, for a layman user who is not exposed to the architect's lingo, understanding and evaluating any space is simply done through experiencing it. In a more holistic sense, a design can be evaluated not simply based on the designer's narrative, but on how well that narrative can be experienced by a user. Along this line of thought, the role of embellishment in architecture can be seen as an architect's tool to communicate their design narrative through creating meaningful spatial interaction with a user.

By experimenting with design aspects like scale, shape, geometry, colour, texture, depth, light, shadow, sculpture, symbolism, etc. the architect can embellish a space which engages with the user's senses. Here, the tool of embellishment allows the architect to add spatial elements and communicate with the user through their perception of space. The need for embellishment is undeniable as it helps make architecture relatable, appealing, memorable and interesting to a user. However, the responsibility of creating a meaningful design expression using such methods of enhancement lies with the architect, such that spaces are ‘being’ rather than ‘seeming’.

To state an example explaining the role of embellishment in architecture, one could draw comparisons between different buildings of the same typology- like higher education institutions. In cities like Mumbai where there is an evident space crunch, precincts like that of the Indian Institute of Technology (IIT) Mumbai, is famous for its green spaces and sprawling infrastructure which creates an inspiring campus, while some top Indian architecture colleges in Mumbai operate out of designated floors within a single building and cannot have a relevant ‘size comparison’ to a campus like IIT Mumbai’s. The design brief for all these institutions revolves around creating spaces for educational purposes. However, the scale, scope and context are very different in each such building. The desired goal of creating ‘an inspiring campus’ and ‘functional learning spaces’ for students is the same - but the resulting design solution of each building is born out of diverse circumstances. Here the tool of embellishment aids an architect in addressing context-centric problems by responding with unique spatial solutions, to achieve the same goal differently in each project.

Sadly, in the practice of architecture, the design process of many architects has been diluted to satisfy the client’s spatial requirements and visual expectations, rather than using architectural design as a means to communicate their design narrative. The ease with which the internet can provide visual references for spaces has made design elements so easy to replicate, that it has thinned the architect’s unique creation of spaces to mere space replication.

Many argue that architectural practices are part of the service industry as they cater to a client. Therefore, architects must adhere to fulfilling client expectations beyond expressing their ideas through spaces. While architecture can be looked at as a service industry that provides design solutions through space creation, it must not be confused with the business of pleasing clients by replicating spaces and falling into styles. Copy-paste design leads to spaces that go out of fashion and do not fully make sense, while spatial design born out of a sound design narrative and meaningful embellishment leads to justified, memorable and timeless spaces.

Given the same site, with the same climatic conditions, design brief and budget, any two architects will have different proposals for the same design exercise. While some ideas and concepts may be similar, their outcome is unique to the creative expression of each architect. This is the beauty of how authentic thoughts take shape into spaces, and the art of being able to do so meaningfully must be preserved, especially in the face of growing trends of ‘Pinterest-fication’ of architecture.

Unlike a purely technical field, or a scientific experiment, where there is a particular 'correct answer', creative fields like architecture do not have a proven design methodology that will lead a designer to the most accurate design solution. However, contemporary architects can always draw from the various schools of thought and a contextual understanding of the works of their predecessors and the evolution of sensibilities and technology in the field.

There have been many debates in architecture about the importance of form, function, style, building technique, sustainability, etc. while all these aspects have their own significance, no single aspect has been a clear winner. What remains common in the many different facets of the field of architecture, is the role that it plays in shaping human interaction with spaces. Using the tool of embellishment in architecture aids in making these spaces memorable. However, the responsibility to embellish meaningfully lies with the architect. Finally, while there is no single correct answer, one can be satisfied in recognizing a ‘good design’ as that which is well justified and born out of a sound design narrative, such that it engages through ‘being’!

Ar. Asmita Raghuvanshy graduated from the IES College of Architecture, Mumbai in 2018, where she was the Magazine Secretary in the Students’ Council. She has worked with architectural firms in Nashik and Mumbai, and since the onset of the pandemic has been freelancing. She has also completed a Permaculture Design Course to explore ecological landscaping through her work.
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JOURNAL OF THE INDIAN INSTITUTE OF ARCHITECTS

ARTICLE

CONCEPT OF CIRCULAR ECONOMY IN BUILDING CONSTRUCTION

Ar. Avitesh

Circular economy is a model of making and utilization, which started in the late 1990s and promotes more and more reusing, refurbishing, repairing and recycling. Circular economy (CE) has grown progressively and has been adopted in numerous industries and nations. CE in the built environment offers a lot of advantages since it has the ability to minimize the building industry's environmental and carbon impact. The construction industry is responsible for around 30% of all natural resource exploitation and 25% of all solid waste created worldwide. Basically, this industry is working with a linear economic model which means 'take, make and dispose'. This means taking raw materials and then use for building construction and dispose them at the end because they are made for single usage and do not have the ability to be reused. This article seeks to give an overview of the evolution of research and the formation of ideas in the building sector, as well as to identify contemporary developments in how a circular economy can be employed within the construction sector. The discussions are valuable outcomes of the CE model application in recent times, waste creation and resource extraction in the construction industry have been reduced significantly.

Introduction:

An economy is a domain that tells about the production of any company or product, transportation and sale of goods and services, and also the utilization of those products and services by multiple components. It is defined as "a social domain stressing behaviours, discourses, and material manifestations associated with the development, use, and management of resources." The building construction industry is a major player in both the economy and the environment. This industry impacts the economy and provides primary and secondary career opportunities, satisfying people's structural and comfort needs. As per the survey done by the European Commission in 2020, the construction industry is an utmost consumer of raw materials and is responsible for approximately 45% of all energy and procedure emissions, because of these emissions this industry is the culprit of acid rain and calculation of current scenarios will definitely result in a crisis (European Commission, 2020). Using the circular economy model can be a significant contributor to any attempt to combat global warming and provide greener products. Also, these negative effects on the environment, construction and demolition activities create almost a third of all waste, mostly this waste is dumped for landfilling which is causing environmental issues and affecting a building's lifecycle (Munaro et al., 2020) (Christensen, 2021).

Another major cause of worry is the growth in raw material prices, which encourages the building industry to employ more sustainable and alternative resources which can be easy to reuse and recycle. In light of this, it can be inferred that the construction sector faces an immediate need for a change from its present perspective to a more durable one, with a particular focus on implementing the circular economy strategy to assure an innovative construction sector. The construction industry worked on a linear economic system based on the concept of 'take, produce, and discard'. This model involves extracting raw materials from the environment, processing them into materials for building, and then assembling them on site. After the life of the building has ended, the building becomes obsolete, and the waste generated is disposed of in landfills or incinerated (Rizos et al., 2017). Circular economy, on the other hand, is aimed at better resource management and is becoming increasingly popular in the last several decades. The circular economy model has building materials that are used to construct new buildings. Their components and parts are repurposed and deconstructed into material banks for use in new buildings, allowing them to act like material banks, and keeping materials and components in a closed loop. Hence, this article is to discuss the latest developments in the use of circular economy concepts in the construction industry (Charef et al., 2021).

Linear Economy

Previously, we were working on the linear economy model. For the manufacturing process of any product, raw materials are used and after it is used, any leftover materials (such as packaging) are discarded. Recycling is the economic backbone of an economy based on reuse. According to the linear economy concept glass will be wasted after use or damage but it can be recycled and produce a new glass and waste paper. Materials run in a straight line from resource extraction through industry and finally to waste in a linear economy which will affect the natural resources. As per the study we are using 175% of available sources. A linear economy is characterized by two unsustainable processes: scarcity of resources and an excessive amount of pollution produced by humans. These two factors contribute to environmental degrading practices, wealth concentrations, and social disparities. The linear economy is the product of commercial operations that are based on the assumption that natural resources will always be available. Because of this, people have developed a mentality of take-make-dispose. These beliefs are grounded in the extraction of resources, the manufacture of goods and services, and the disposal of trash generated after the consumer has purchased those goods and services (Womer, et al, 2003; Hart, et al, 2019).

As a result of the negative environmental and economic consequences of this method, this technique is coming under growing pressure. In the linear economy, there is a negative ecological consequence in that the production of things takes place at the expense of the productivity of our ecosystems. A significant increase in the amount of strain placed on these ecosystems puts the supply of vital ecosystem services such as water purification, air purification, and soil cleansing in jeopardy. This economic model puts the supply of raw resources at risk as well as the provision of ecosystem services, which is in addition to the harm caused by the linear economy to ecosystem services provision. Increasing demand, fluctuating raw material prices, scarcity of raw materials, geopolitical dependence on diverse materials, and variable raw material prices all contribute to this level of uncertainty. We must promote a circular economy so that we can assure that raw resources for food, housing, warmth, and other essentials remain available in the future. To accomplish this, you have to use materials and products more efficiently, as well as properly reuse those materials and components. It is imperative that new raw materials be obtained sustainably in order to avoid harming the natural and human surroundings (Guerra and Leite, 2021; Christensen, 2021).

Drawbacks of Linear economy

Linear economy model is based on 'higher the consumption-bigger the economy and related activities. This is the economic paradigm that today dominates our cultures since the Industrial Revolution. In this paradigm, organizations and companies gather raw materials needed from nature and use them to manufacture things that are destroyed very soon, typically just under a very short time period. Despite the fact that the planet has the ability to regenerate what has been extracted, this take-make-use-dispose statement is totally opposite to the consequences of this process, which include the decay of many natural ecosystems, greenhouse gases and deterioration of public health, biodiversity loss, and species extinction. Following the linear economy model, approximately 60% of European offices are not in use even during working hours. This model is affecting the environment as air quality is worsening around the globe (Womer et al., 2003; Çimen, 2021).

Linear economy is not only affecting the construction sector but all the sectors at a time. It is responsible for 10-15% of waste during construction. At the time of demolition, 54% of demolition material is landfilled while some countries only landfill up to 6%. Increasing demand, fluctuating raw material prices, scarcity of raw materials, geographical dependencies on diverse materials, and variable raw material prices all contribute to this level of uncertainty. The primary source of concern is fluctuating raw material costs. It has been a significant increase in both the amount and the volatility of raw material costs since 2006. This not only causes difficulties for diggers and buyers of raw materials but also increases the dangers associated with the market. It follows that investment in the mining and production of materials is discouraged, which can result in raw material prices continuing to climb over time. Furthermore, these price changes restrict organizations from formulating pricing projections, resulting in worse competition compared to firms which are less substance in the sources of their raw materials. The fact that so much is produced using scarce materials is another shortcoming of the existing linear economic system, as previously stated. Many businesses, such as the pharmaceutical industry, make extensive use of key elements in their manufacturing techniques, such as indium and chromium. These resources are only accessible to a limited number of people (Bruel, et al, 2019; Munaro, et al, 2020).

In continuation of the disadvantages of linear economy in the construction sector, interdependence and increase in material demand are playing a big role. These factors are as important as fluctuating raw material prices and critical materials. As a result of the expansion of international trade, the interconnection of products on a geopolitical level has become increasingly powerful. In addition to the restricted amount of raw materials that are already accessible, a major increase in the demand for resources is expected in the near future as well. As per the survey of population and welfare

growth, middle-class consumers would increase by almost four billion by 2030. In addition, the product's useful life has been decreasing substantially in recent years, as well. This is one of the primary causes behind the increased exhaustion of raw materials in the world. As a result of a process known as positive feedback, product lifespan is continuing to decrease: consumers demand new products faster and consequently utilize their "old" products for a shorter period of time. Because of this, less quality will work throughout a product's lifecycle, which leads to consumers demanding new products even more quickly (Womer, et al, 2003; Hart, et al, 2019).

Potential solution with System thinking

As discussed earlier, the linear economy model is based on traditional thinking where we assumed that the availability of resources is endless which is far away from reality. Now we know that we are consuming and wasting resources which is the main reason for the end of the chase. Now, we stand where we need a potential solution which should be sustainable and beneficial for all the industries. This outcome should be a good response or solution to minimize consumption and waste. It is not only good for regenerating and reusing the products or services but also a remedy for returning the resources to the environment. In a linear economy, we are taking resources with one hand and after consuming them just throwing them with another hand which is causing the availability of resources. So now we are thinking about a way which can help to optimize the utilization of resources. For a good sustainable solution, we should take a holistic approach so that we can store resources for the next generations also. So this solution will work for every industry because the problem is affecting everyone. The first step should be to integrate all the systems so that it will be easy to approach and in solution finding (European Commission, 2020).

When it comes to system integration, systems thinking refers to a method of approaching integration that is predicated on the notion. Systems thinking is a technique to solve problems that consider problems as components of a larger and more dynamic system of interconnected parts. It is the process of gaining an understanding of how different objects interact with each other as a part of a larger whole. The goal of systems thinking is to see systems as a whole, as opposed to positivist and reductionist thinking. Systems thinking is consistent with a typical philosophy of gaining an understanding of a system by investigating the relationships and interactions between the pieces that make up the system as a whole. In practice, systems thinking pushes us to look into inter-relationships (context and linkages), views (each actor has their own perception) and limits, that is the line between acceptable and unacceptable behaviour (European Commission, 2020; Charef and Lu, 2021).

Circular Economy

Definition of circular economy says that it is a strategy for economic development which is systemic in nature and beneficial to enterprises, society, and the environment as a whole. A demand and supply strategy that emphasizes the repurposing, repairing, refurbishing and recycling of current materials and components in order to maintain materials within the economy as much as feasible. It is possible to define the CE model as "a reformative system in which resource input and waste are decreasing or minimized. Resource loops that are slowing down imply that items are being utilized longer and more intensively in order to maintain their worth over time, whereas resource loops that are closing encourage up-cycling in order to restore or create new value from spent materials. As the last point, closing resource loops implies environmentally friendly solutions that can reduce and increase the reuse of resource intensity and are beneficial for the environment (van Stijn et al., 2021).

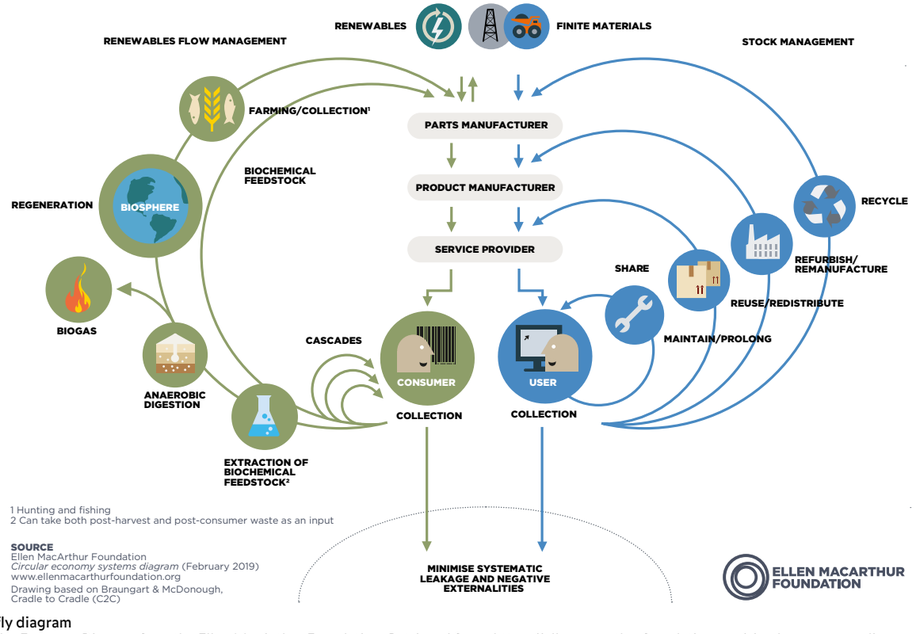

Fig. 1: Butterfly diagram
(Source: Circular Economy Diagram from the Ellen MacArthur Foundation. Retrieved from: https://ellenmacarthurfoundation.org/circular-economy-diagram)

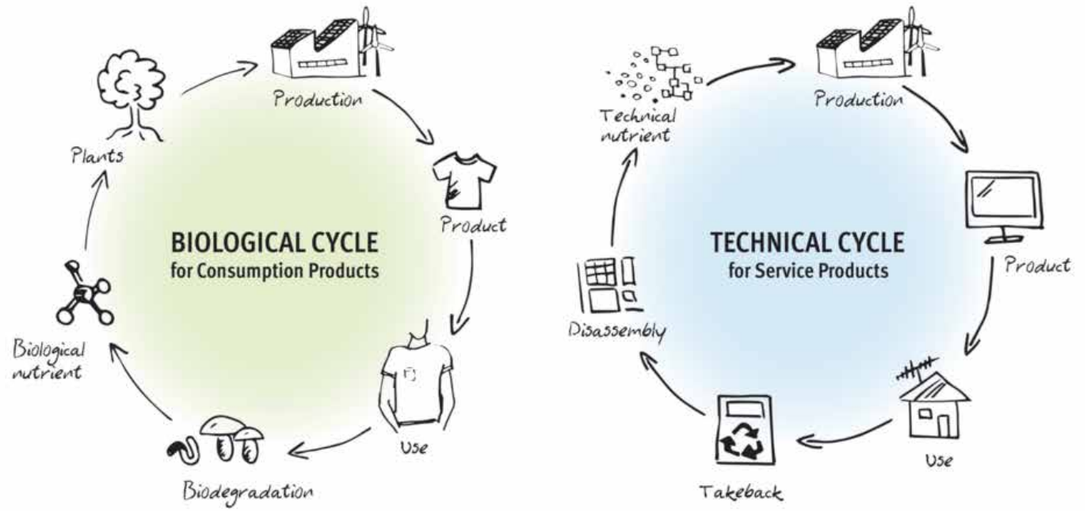

Fig. 2: Technical and biological diagram
(Source: EPEA, part of Drees and Sommer. Retrieved from: https://epea.com/en/about-us/cradle-to-cradle)

The amount of accumulated material stocks is nearly ten times greater than the amount of material throughput in a given year. Houses, commercial buildings, roads and other infrastructure are built, maintained and repaired, and this represents the greatest resource footprint also accounting for yearly resource consumption and responsible for 20 per cent of total global greenhouse gas emissions. According to Hertwich et al. (2019), the most significant uses of materials in the building sector which are responsible for GHG emissions are cement, metal, wood and concrete. Indeed, these materials are accountable for more than half of the carbon emission of built structures and approximately 40% of global greenhouse gas (GHG) impact from total material manufacture. Because the urban built environment is predicted to develop by approximately 50-60 per cent by 2050 in order to meet the construction sector demand of the future urban population. The construction sector is critical to attaining the climate change mitigation goals set forth in the Paris Agreement on climate change (Guerra and Leite, 2021; Larrinaga and Garcia-Torea, 2021).

Its origins can be traced back to the 1970s, and it is a combination of Rome's 'Limits to Growth' theory, Braungart and McDonough's 'cradle to cradle' concept, Stahel's 'performance economy,' with Lyle's 'regenerative design' model. The Ellen MacArthur Foundation, a non-profit organization that encourages the circular economy model worldwide, has lately brought the method to the public's attention as a result of its efforts. On the basis of these studies, the Foundation produced the diagram which describes the system thinking process called the butterfly diagram, which is based on the premise that material flows can be separated into two loops: the technical supply cycle and the biological resource cycle (ARUP, 2016; Zairul, 2021).

The butterfly diagram shown in figure 1 appreciates the idea of being used, not as a consumer, keeping product and material in use by prolonging the life span or product should be maintained for the maximum duration. At the stage of design, consideration of maintenance and repairing is important which goes along with the durability of the material. When a person is a user of a product and not a consumer, possibilities of sharing will be increased among users which will reduce the consumption of a material/ product. The Ellen MacArthur Foundation with the butterfly diagram proposed restoring, remanufacturing and refurbishing to maintain the resource loop also reducing the product all the way back to its basic material where the process of restoring gives the value of the product and under the remanufacturing process, the whole product is disassembled into basic units and necessary parts are replaced before redistribution. The refurbishing process doesn't disassemble the product and does a cosmetic makeover of the product. Most or at least a few parts are remade into new products. Basically, this process is going to minimize the waste and input the raw resources. Waste materials that we get after the process will be helpful to nourish nature and the effect on the environment will reduce (Hart et al., 2019).

The biological cycle focuses on renewable and plant-based resources for the use of products that are easily regenerated and safely returned to the environment in the form of

composting and anaerobic digestion to support the planet's life. The bio-economy is a fast-growing industry that has the potential to minimize raw material consumption and waste, and generate higher-value commodities for long-term ecological recycling while simultaneously cutting prices. The second one is a technical cycle (Fig. 2) that focuses on man-made products which can be reused and repaired for prolonged use. These products are designed in a way so that after the end of their service life, their components can be extracted and reused or remanufactured into new products, thereby reducing waste and increasing efficiency. This prevents debris from being disposed of in landfills and establishes a closed-loop cycle (Charef et al., 2021).

Concept of Circular economy based on multiple theories

The implementation of CE methods appears to take place in a variety of ways depending on the country. It can be on a micro, meso or macro level. For example, a few countries encourage the CE model at the micro-level (at the level of businesses or consumers), while others do so at the meso level (at the level of eco-industrial parks), and still others do so at the macro-level (at the level of governments) (cities, province, and country). It appears that when it comes to the implementation of the CE model, all the government agencies and private corporations use old concepts that are already being used in other disciplines, rather than developing novel ideas from scratch (Al-Hamrani et al., 2021; Rizos et al., 2017).

Today, CE is widely known as a paradigm for manufacturing and consuming goods that encourages the use of closed-loop systems to optimize the use of resources while decreasing pollution and waste. Promoting environmental conservation has as its ultimate goal the decoupling of environmental strain from economic expansion. All the concepts behind circular economy are based on environmental aspects. A circular economy is a holistic approach to biomimicry, blue economy, ecological economics, industrial ecology, performance economy, regenerative design, cleaner production and cradle-to-cradle concept. On one hand, concepts driven with the help of biomimicry, blue economy, cradle to cradle and ecological economics will help to minimize emissions and every output is returned harmlessly to the ecosystem as a nutrient and sometimes it becomes an input for another manufacturing process. Industrial ecology, performance ecology, regenerative design and cleaner production, these all concepts are working on the product-life extension, long-life goods, reconditioning activities and waste prevention. Essentially, this approach focuses on product creation for profitability in terms of positive impact and minimizing negative impacts via efficiency (Bruel et al., 2019; Gallego-Schmid et al., 2020).

The advantages of circular economy model in building construction

Under the linear economy, activities which are related to construction and the built environment are the primary causes of natural resource limitations, including strategic materials, water, crushed aggregates, increased pollution, and material needs. Construction has significant ramifications for society, the economy, and the environment because it is one of the largest consumers of raw materials and energy which generates the greatest quantity of waste and CO2, and has the greatest impact on the most economic activity. Construction waste is generated as almost 40% of all waste by demolition activities and it contributes to both noise and air pollution. The building construction industries are the most significant contributors to waste generation which is up to 45% of solid wastes in urban areas, according to the Environmental Protection Agency (Christensen, 2021). Building materials account for 65 per cent of global aggregate consumption and 20 per cent of overall metal material consumption, with construction accounting for 60 per cent of total raw material consumption. Looking beyond the construction industry, the built environment in metropolitan settings accounts for half of all resources extracted, 35 per cent of all CO2 emissions, and up to 30 per cent of all garbage generated from a variety of materials, including concrete and other metals (Norouzi et al., 2021; Joensuu et al., 2020; Anastasiades et al., 2020).

To apply a circular economy in the construction sector, the division of scales according to the area is really important. We can divide our construction sites on the basis of city, area, type of building and construction material. Cement, aluminium, steel, concrete and plastics are four of the most regularly utilized building materials in the construction industry, according to the Asian Civil Engineering Coordinating Council. Building and infrastructure projects, while they serve a variety of functions, account for a major share of the total demand for cement and other building materials and products. Due to the fact that the manufacturing of these materials accounts for a significant portion of greenhouse gas emissions, we must develop ways to decarbonize our economy and achieve climate neutrality by 2050 through decarbonizing our built environment. We must have a strategy in place for the construction materials (Benachio et al., 2020; Charef and Lu, 2021).

Concrete is long-lasting, allowing buildings to be reused and repurposed long after their initial design life and for more efficient resource utilization. Because of its endurance, concrete is an excellent material for designing for disassembly. Aspects of a project can be designed to be recoverable and re-usable in other initiatives. The use of concrete demolition waste as an aggregate at the end of its useful life, if reuse, repurpose, or disassembly is not practicable, can reduce both the extraction of raw materials and the amount of garbage sent to landfill (Ekins et al., 2019).

The use of recycled concrete is road building with minor amounts also being used in the creation of fresh concrete. When recycled aggregates are utilized in concrete production, the quality of the concrete can be maintained at levels comparable to concrete made with aggregates by optimising the mix design. When recycled aggregates are utilised in concrete manufacturing, it is possible that the cement content will be slightly greater. The aggregated which are recycled concrete basically is a very good and visible example of the circular economy model in action which has numerous benefits including the minimization of the use of natural resources and a reduction in the amount of waste sent to landfills. For the concrete sector, it represents a great chance to make a considerable contribution to the long-term viability of the modern built environment. Same as concrete, we can make a lifecycle for every building material and then it will be easy to recycle and reuse the material (Çimen, 2021; (O'Grady et al., 2021).

Conclusion

During the study of a circular economy for building construction, many gaps were founded. A bibliometric perspective on circular construction and its challenges have yet to be published, and there is no systematic and quantitative assessment of the scientific progress of the CE model in the building and construction industry. Circular construction and its difficulties, as well as increasing the little amount of information already available, have yet to be discovered. A detailed assessment of the literature on Circular economy in the construction industry is provided in this paper. The study came to the conclusion that CE is still in its infancy, notwithstanding recent increases in academic attention and diversity in the field.

The application of CE in the industry of building construction is not in practice. Life cycle analysis of every construction material and the building is very important. Students need to implement this in their projects for better understanding. There is an unequal geographical distribution of the investigations carried out by the CE actors which are governments and institutions. This model is not intended to be ready for practice approach to the life cycle assessment of circular building components, but rather to serve as a tool for further research and discussion, which is why we have included it. As a result, it contributes significantly to the assessment of circularity in the built environment, as well as the transition to a circular economy in the built environment (CEBE). Not just building materials or circular building component but the industry need to focus on circular systems for the future.

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ARTICLE

REDEFINING ECOLOGICAL-TOURISM

Prof. Lakshmi Krishnaswamy

Dean Mozaic Nilaya *(Credit: Dinesh Mehta)*

Tourist destinations holding sway, tend to promote a sensorial immersion in nature and idyllic appeal: A break from the demands and pressures of everyday work-life and rapid pace of production and consumption of urban life. This new trend has given birth to eco-tourism and its built manifestation - the eco-resorts. Eco-tourism is more conscious of the environment, while it provides the much-needed sense of peacefulness in nature.

About three decades ago, sustainability was a novel direction in architecture, a matter of choice. Now, with climate-change, it is deemed imperative, actively pursued by businesses and governments alike. It is also well-known that vernacular systems of building had an innate sense of sustainable practices baked in. It is attributed to a local materials palette, frugal lifestyle and a respect for nature. The challenges of modern times present themselves as architects wrestle to bridge ecological concerns with human consumption attitudes, alongside market realities.

On another front, the eco-feminist lens calls for a critique of current building practices as domination of nature by man and prima facie, it is a sound claim, even if we were to set aside the gendered nature of the discussion.

Eco-tourism concerns itself with minimizing environmental footprint, promoting well-being and interconnectedness with the local culture and a sense of care for their local ecological continuity. The eco-resorts, eco-hotels and eco-lodges broadly form the built environment that incorporates these values. It is expected that the building craft would respect local material, allow local enterprises their space and foster healthy financial inter-relationships. Its central tenet remains to incentivize sustainable practices specific to the site and its context. The design problem is to recognize the spirit of the local culture while minimizing the impact of construction on the environment.

A range of concepts and eco-principles inform the design of a model eco-resort. The climatic adaptability and control, incorporating local materials, innovating and rethinking age old practices and preserving sensitive ecological zones. Here sustainability means a paradigm shift in society and culture at large, about what must be valued and prioritized given a unique context. Therefore, sustainability becomes a more hands-on practice of re-thinking the old, to address the specifics of the project.

The obvious connotation of such an eco-approach respects the natural environment and fiercely opposes toxins and pollutants. Waste management is understood and humanized in the service of the ecological systems through recycling. However, more fundamentally, the objective here is to reduce embodied energy and limit resource consumption. Operational concerns that include costs of transportation of people, goods and construction materials add to the complexity.

Majority of these eco-resorts are found in tropical regions. Therefore, building orientation, site layout, and massing become significant design decisions that can preemptively help achieve the outlined objectives.

The feeling of repose or vibrance is instilled in the spaces by regulating the atmospheric temperature and humidity, the play of light and sonic elements. The typical design elements include, a staggered orientation of individual blocks with a built orientation that avoids the hot sun, air-vents, optimal air flow circulation etc. Landscape architects complement the design with the intentional use of biodiversity and indigenous plants that can add a distinct character to the spatial character of the resort.

That being said, one has to note that these projects have significant fiscal challenges. On the one hand, reduced costs are favored by clients, it becomes difficult to attract quality design expertise on a small budget. There is some improvement overall in this regard, with reputed design houses entering this domain.

The present scenario is a blend of eco-mindedness that is preceded by years of experimenting with convictions in architecture. As an example, Revathi Kamath designed a resort in Mandvi, Rajasthan and that exalts her passion for mud architecture. The tenets of this architecture were meticulously laid down by the likes of Laurie Baker, Didi Contractor. Several architectural practices have also emerged out of the Aurovillian worldview.

The contemporary times have sprung forth eco-resorts and boutique hotels; Among the new-age practices, few labor to genuinely locate their design agenda within the spectrum that ranges from community building to ecologically benign architecture to now, up-scaling, reusing, retrofitting etc. What stands out ultimately, is the durability built into both the materials and the vision for the projects that make them sustainable in the long run.

The future of eco-resorts is only expanding, with its myriad of technical, aesthetic and market considerations, architects are defining their own distinct relationship to sustainable design practices. While some focus on enduring value for the client and community, others look to make buildings that endure its situatedness in nature. Still others root architectural sustainability in enhancing the notion of wellness that center your mind and body.

Illustrative Examples

Tony Joseph and Team | Stapati Architects

Selected as one of the 100 most influential design firms of South Asia by Architectural Digest, consistently between 2014-2019, Stapati believes in integrity, sustainability and innovation. Several prestigious international collaborations and recognition to boot, their foray into eco resort started with The Vythiri resort in Wayanad, which was done along with Ar. Prasanth A K. The idea was to showcase Wayanad as an exotic tourist destination just like the well known points in the Nilgiris. Tony Joseph trained in the Charles Moore programme at UT Austin, returning with a penchant for regionalism. He maintains that ecological concerns and commercialism can co-exist. Though at Vythiri, ad-hoc additions to the original designs have diluted the original conception, the resort is still well regarded by the architecture community and the tourists.

Here, the footprint is kept minimal such that the building mediates the rich vegetation gently as the perennial stream flowing down the site gives the abandoned coffee plantation its character. The Mud Plastered walls, terracotta flooring, sloping tiled roof clothe the spaces in a regional narrative. The building itself is envisioned to recede into the thick foliage, engulfing the living spaces invoking the concept of the jungle. The floor is lifted on stilts such that the natural rock formations are not disturbed. The ropeway designed atop the waterfall is meant to enhance the experience of the natural soundscape. Taking cue from traditional architecture of Kerala, the seating is eked out of exposed rubble plinth finished in mud plaster. On the highest point the restaurant almost disappears into the landscape. The natural curve in the outcrop, an area dramatically jutting out, is cleverly used to bring the treetops at eye level. The theatre winds up with the restful pool on the other side at a lower level.

In Seychelles, Stapati and a businessman, Sunil Shah, of Indian origins come together to reclaim an island, to capture in the built form the fast disappearing creole architecture of the region. The plants cultivated and acclimatised to be sent over to the island without damaging the surrounding Coral Reef was an arduous task.

Nearly a hundred pieces of antique furniture, restored in the Kochi studio were sourced from south India over a period of four years. The painstaking effort and uncompromising

The Boutique eco-hotel, Amrit Bhavan, Haridwar

Vythiri Resort

vision of Mr.Shah culminates into this intimate resort that carries the imprints of his life here. The design spares every natural feature, be it even a boulder, as it finds a way around it. The built form is the natural consequence of the interaction of spaces. Thus, the Enchanted Island Resort marks its place as the world's leading Private Island Resort.

Dean D'Cruz | Mozaic GOA

In the early years of his architectural practice in Goa, Dean partnered with Gerald D'Cunha under the name Natural Architecture, influenced by Laurie Baker. He felt at home in the humanistic scale that is direct, sustainable and low-cost. He is partner in the architecture design studio Mozaic, that views design as an assortment of various connected disciplines.

The Nilaya Hermitage is a reputed and award-winning eco-resort, built out of the stone excavated from a hill behind the site. There is extensive use of renewable timber in the form of coconut rafters. The rooms are themed on elements of nature, with marble powder, marble chips and natural pigment that form the terrazzo flooring. Several abstract vegetative patterns adorn the floors and walls especially in the bathing area. Old artefacts and furniture have been handpicked and refurbished. The rooms are spanned by brick funicular domes while the core area is largely left bereft of partition, structurally designed to maximise air-flow, openness and connections to the outside. The firm strongly believes in post-occupancy analysis of the performance of their buildings as important feedback and learning tool. One of the most dominant features of the interior spaces is the color which is derived from the elements the rooms are named after.

Saili Malpani and Gaurav Chandiwala | Tekton Architects

Link to photos: https://photos.app.goo.gl/4sawEYkw1q5QmscMA

Batchmates, who have collaborated on many architecture and interior projects come together to design and retrofit an old residence in Haridwar by the Ganga River. Their previous collaborations, demonstrate keen prototyping and pattern making sensibilities; be it in using Mangalore tiles with colour infills in various permutations for flooring or recreating a traditional jaali from Kerala for a shutter element in Delhi, sustainability is found in traces of familiarity and finding wit in craft.

The Boutique eco-hotel, Amrit Bhavan adapts a family home into an emblem of slow living. Luxury is marked in the inter mixing of textures of building materials, the river, the hand-crafted products and the bid to revive dying crafts. The 4 Room home, expanded to house 8 guest rooms in its hotel avatar. Inspite of these additions, the architects managed to bring in natural light which was missing previously. There were programmatic additions to the original structure such as the library, a lounge and a dining area. The guest room with its thoughtfully assigned pastel shades comes alive in natural light. As a counterpoint, the in-situ terrazzo articulates the wall walls.

The old furniture of the building was sought out to be refurbished and made a part of the new life of the building. The furniture designed in-house displayed use of cane woven in many different ways to restore a sense of craft and interest. Use of bamboo screens added lightness to the structure as it lent the spaces its much-needed privacy.

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MEERA DEOBHAKTA

NOT ANOTHER ERA

Ar. Harshad Bhatia

After leaving college with a graduate degree in hand, seldom does one immediately realize that learning never stops. But sometimes one comes across seniors and tested architects who share their experience with the juniors. However, some of these senior professionals stay away from the limelight while relentlessly working in and for the Architecture discipline.

On such architect is ***Meera Deobhakta,*** *who has been running a practice, teaching and associating with the various professional bodies for betterment of Architecture.*

Meera's maiden surname was Sane, and her father was a partner in M/s Sane & Paymaster architects, a noted firm based in Bombay. Her education in architecture was from the Sir J J College of Architecture in 1962. Though equally eligible for B Arch degree, she graduated with the G D Arch at the behest of her father, who advised that the curriculum was suited for pursuing professional practice.

In May 1962 she tied the knot with Prof. Madhav Deobhakta to start a domestic life. Her background may have influenced her foray into Architecture, but she was also pursuing a parallel degree of B Arts in Child Psychology while doing the G D Arch course.

Within a decade after her degree, Meera gave her time and active effort to the Indian Institute of Architects (IIA) from 1971 till 1992. Her involvement included roles at the level of local Centres, regional Chapters and the National body of IIA. With her academic bent as a researcher, she was a valuable member of the editorial team under Prof. Akhtar Chauhan, then Editor of the Journal of the Indian Institute of Architects (JIIA). Likewise, with the experience of managing a practice, Meera's role as a member of the Finance Committee under Architect Datta Malik from 1988 to 1992 was well placed.

These experiences in honorary capacity for the IIA showed her caliber and commitment to the professional body. In further realization of her ability, Meera Deobhakta took charge as Treasurer under the leadership of noted Architect Rusi Khambatta, for the ARCASIA Conference in 1990. This Conference generated a surplus of Rupees 7 Lakh. Her honorary contribution in the IIA was noticed and Meera was given the Best Worker Award in 1991 and 1992, for two consecutive years, on the IIA Council's insistence despite the then President of the IIA, Prof. Madhav Deobhakta's objection on the ground that she was the President's wife and that may be seen as a conflict of interest. As an educatior, she was in-charge of the B Arch bridge course from 1985 to 1988 at Rachana Sansad's Academy of Architecture in Mumbai.

With economic liberalization and opening the doors to privatization in the early 1990s, Mumbai witnessed the setting up of many new colleges imparting the B. Arch. degree. Meera Deobhakta was invited to teach at the Rizvi College of Architecture and the Indian Education Society's (IES) College of Architecture, both in Mumbai. She was a guide for Design Dissertation and at IES College she took charge of the Special Courses under their Core Competence Department in the Management section. Since then she has been associated with some newer institutions as member of Governing Council, Managing Committee, Academic Committee to teaching and examiner at viva voce or external evaluator.

Residing at Chembur in their self designed independent house, the Deobhaktas have often been actively involved in Advanced Locality Management (ALM) as citizens of the neighbourhood. In similar vein, the 21st institutions of Chembur Trombay Education Society's (CTES) College of Architecture and the Vivekanand Education Society's College of Architecture (VESCOA) have appointed Meera and Madhav Deobhakta in various capacities to guide the college for education of an architect in an informed and objective manner.

Architecture practice, education and professional body involvement may be everything for some. But for Meera Deobhakta, these were expected tasks that she understood from the moment she set about to be an 'Architect'. Her sights went beyond these fundamental duties after the Deobhaktas were invited by the World Society for Ekistics (WSE) to become members based at Athens, Greece. The term 'Ekistics' was given birth by Constantinos Doxiadis (1913 - 1975) and it means 'the science and study of human settlements'. The exposure to Ekistics has played a vital role in Meera's thinking and doing.

Meera managed the Commonweatlh Association of Architects (CAA) and WSE Conference held at Goa in 1988, which were widely represented by noted Indian architects and international delegates. Noticing her interest, knowledge and objective quality that made the CAA & WSE Conference at Goa successful, she was invited by the Secretary-General of WSE Prof. Panayis Psomopoulos to be a member of the WSE Executive Committee. Both Prof. Madhav and Meera Deobhakta have since played a vital role for imparting the Ekistics way of studying human settlements.

Following the success of the 1988 Conference, Meera took charge of a wider event that included a 'dialogue on the move' to enable outreach architects, planners and allied professionals in various geographical locations. This was the CAA-WSE Conference on Education of a Design Professional (EDP) for 'Synthesis of Tradition & Modernity for a Sustainable Society', which was held in India, Sri Lanka and Maldives in September 1995. My first main involvement with Meera Deobhakta began with the EDP-1995 Conference. I observed and learned how she managed home and hearth with equal priority and time to organize the EDP-1995 Conference. These were times when the enterprising industry of 'Event Management' was not known. Meera was like the EDP-1995 event manager but with full knowledge of the subject content. She multi-tasked with the efficiency of an experienced and prized secretary to identify speakers, topics, program timetable, correspondence, budgeting, booking, etc and edited the theme document content of papers like a subject expert referee for a professional scholarly journal and an award winning researcher.

In 2010-2011 Prof. Madhav Deobhakta was honored with the Presidentship of the WSE and under his leadership and Meera's full time contribution and management the WSE Convention was successfully held in India (from Mumbai - Navi Mumbai - Pune - Lavasa - Mumbai) in 2010. The international delegates and senior members of the WSE, suggested to hold a Workshop of Ekistics Education. With Prof. Madhav Deobhakta President WSE, Meera took it under her capacity to manage a Teacher's Training Program (TTP) as per Council of Architecture (COA) India. This was successfully held over a working week in 2011 at the CDSA in Pune. Attending teachers from colleges in India benefited from the experience shared by international academics, practitioners and trainers with application of Ekistics in their work.

Meera Deobhakta's life in the discipline of Architecture includes a design practice and being informed of essential knowledge in valuation and arbitration, with which Prof. Madhav Deobhakta is well versed including in practice. In a humane way, Meera's upbringing is with a "live and let live" attitude to all living beings. She is a founder trustee of *'Sanjeevan',* which means 'rejuvenation of life'. *Sanjeevan* was set up in the first decade of 21st century. Her love for animals and Nature can be seen in the Deobhakta's homes at Mumbai and Lonavala, where she continues to care for and nurture birds, domestic pets and animals with equal rights of survival.

On the academic role other than teaching, guide and examiner, Meera is also a founder trustee of *'Rudra Sansthapan',* a trust for education and research. *Rudra Sansthapan* has been supporting various initiatives that include sponsoring deserving candidates to undertake research in traditional settlements. Similarly, the Deobhaktas have set up *'Abhivruddhi',* an organisation that continues to promote academic courses that add value to formal education.

Today, say the words "Professional Practice" in an educational institution in India and Prof. Madhav and Meera Deobhakta's book published in 2007, titled 'ARCHITECTURAL PRACTICE IN INDIA' gets mentioned. This book was supported by the Council of Architecture India and is well received. With reader's queries they followed up with a topical publication in 2011 titled 'ARBITRATION FOR ARCHITECTS & PROJECT MANAGERS' and recently in 2021 the latest book titled 'FUTURES OF RELEVANCE - ARCHITECTURE AND BUILDING PRACTICES IN INDIA' was published through Super Book House. The Deobhakta's have not just authored a major part of the latest book but have ventured as editors to include chapters from other contributors to make a point viz. instead of fragmenting the role of an architect through subject specialization after the basic B Arch, here it all comes together. And with her "live and let live" motto, Meera Deobhakta has also written on shelters by birds and animals, for us to also learn from Nature.

With Ekistics thinking, Meera Deobhakta's perception widened to see all scales of population, from individual to the World. She has traveled extensively with Prof. Madhav Deobhakta and continues to be active as ever for bettering the profession, its bodies and education in a progressive manner to be as relevant with the times within the global scene.

Madhav and Meera Deobhakta at the Vivekanand Education Society's College of Architecture, Chembur, Mumbai (2020). Photo - Harshad Bhatia.

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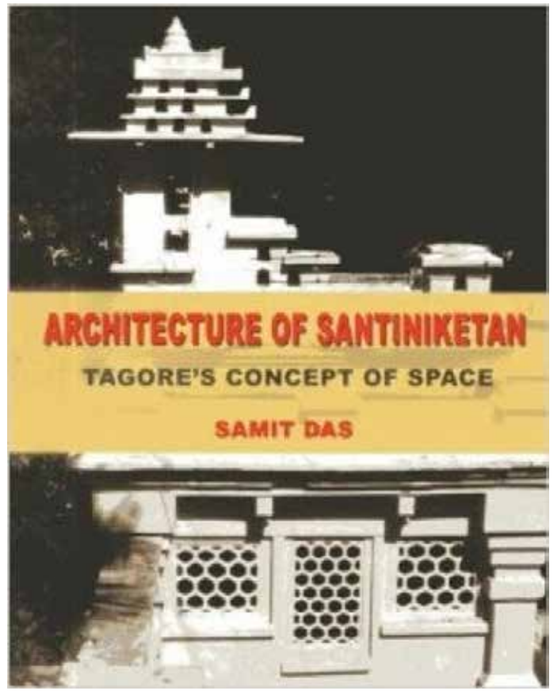
ARCHITECTURE OF SANTINIKETAN

Tagore's Concept of Space

Author: Samit Das

Reviewed by: Dr. Mamatha P. Raj and Dr. Dakshayini R. Patil



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Yatra viswa bhabatyeka needam
Where the world is your home.
Rabindranath Tagore about Visva Bharati, Santiniketan (p. 30)

India has many rich architectural icons that are symbolic of their era and become the epitome of a philosophical school of thought as they continue to charm for many years ahead. One such icon is the multi-faceted creative genius Shri Rabindranath Tagore's *Santiniketan* or 'the abode of peace' at Kolkata which was founded by his father Maharshi Debendranath Tagore. Tagore's multifarious dimensions of ideas, expressions, and actions in the domain of literature gave birth to this noble architecture of balance, sustainability and progressive stature at Santiniketan. This book by Samit Das takes us on an insightful tour of Tagore's legacy along with a few of his magnificent poems and paintings across the 8 chapters. Reviewing of such subjects rendered much delight to the authors, transporting one to the days of yore.

The foreword by Prof. Swapan Majumdar gives a striking backdrop to Tagore's journey in creating the Santiniketan ashram with his informal yet natural architectural abilities. Santiniketan became an embodiment of empathy in architecture respecting the land and nature. Tagore expressed that the height of any building should not have gone above that of the tallest tree in the vicinity. The campus on a rain-scarce, vast wasteland later into a haven of rain-prone rich greenery hosted enriched learning environment.

Das begins with an introduction of himself as a resident of a small natural town in Jharkhand moving to the metropolitan life as a student of arts at Kolkata in 1988 when his quest for the meaning of 'leisure' took seed. His whole perspective, from the openness of his hometown to the clutter of the city, was drastic and this quest brought him to Santiniketan where his seven years stay at Kala-Bhavana exposed how buildings could exist in harmony with their surroundings. Delving into Tagore's writings, paintings, poetry and songs further enriched his experience, while photography of the architecture opened newer perspectives. His inquiry thus, 'Why can't Indian art be evaluated from its indigenous perspectives?' led Das to study the history of the Bengal Renaissance and Tagore's philosophy about Santiniketan and his various residences such as Jorasanko Thakur Bari and Pathuriaghata.

Figure 1: Udayana (p 16)

Figure 2: Toran or Gateway (p 24)

Figure 3: Tagore at Sural Kuthi Bari with the strangely assembled furniture (p 160 and 161)

The architecture that Tagore along with his trusted team comprising mainly Surendranath Kar, Patrick Geddes, Arthur Geddes and Nandalal Bose adopted impressive elements from various genres- Hindu, Buddhist, Islamic, Gujarati havelis, Angkor Wat, Ajanta-Ellora, Japanese tearooms, Greco-Roman columns, Dutch or the Bengali *dalans* (Figures 1 and 2). Yet there is a unified and synchrony among the many buildings comprising institutions, library, residence and temples. Tagore opines based on learnings from Vedas or Upanishads that the inner truth of the ashram calls upon to renounce, only then would creativity get expressed well; and clarifies it is not a hermitage but a place that would inspire life to blossom.

The school in Santiniketan must become the link between India and the world- a centre for the study of humanity must be established.
Note to his son Rathindranatha (p. 35)

Das makes a point that even today there is a pressing need to accommodate and integrate environmental awareness in the architecture of institutional buildings. The ideology of design was access to nature, combining aesthetics with utility, economy and practicability; Tagore advocated for social reforms at the smallest unit of society- villages and hence the Ashram had a *shiksha kendra* for conventional studies) and *palli karukari kendra* for vocational training. The book gets into details of architectural elements such as lintels, canopies, verandahs and furniture intricately weaving the story envisaged by Tagore, beautifully captured by the eye-catchy monochromatic photographs by Das himself. One example would be the way Surendranath Kar used motifs on gateways or columns that are inspired by elements from surrounding nature. The various dwellings of Tagore- Konark, Shyamali, Mrinmayi, Udayana, Dehali, Punashchaudichi and Taan kutir, Ratan kutir, Mohit kutir, Samindra kutir are described to demonstrate new idioms of manifestation of Indian traditions (Figure 3).

In the last chapter, Das explains the way the architecture of Santiniketan has been changing over the years, owing to its becoming a Central university and a shift in Tagore's philosophies. Santiniketan is unlike any regular university but a place where a deep relation between nature, architecture and education is upheld. However, Das concludes that insensibility and short-sightedness have either destroyed many of the buildings or have been altered illogically.

The book engages and inspires readers to visit Tagore's architectural legacy to experience it in person and ponder on the criticality of institutional designs based on strong philosophies rooted in principles of nature. This book discusses a body of work of intense research by Samit Das supported by Tagore's poems and Das's photography makes it a worthy read and feast for the eyes of architects and opens contemplations under various aspects of design.

All images are from the book: Courtesy- Reviewers.

Author
Samit Das, born in 1970 in Jamshedpur, specialises in painting, photography, interactive artworks and artists' books. He creates multisensory environments through art and architectural installations and has a deep interest in archiving. He has studied Fine arts from Santiniketan Kala-Bhavana and at London. He has held solo shows in Delhi, Kolkata, Chennai, Mumbai, Singapore and London. He has documented the Tagore House Museum Kolkata (1999-2000). Samit's research on Santiniketan's architecture started in 1994 and culminated through exhibitions, radio talks and slide shows including *The Idea of Space and Rabindranath Tagore,* a photographic exhibition at Lalit Kala Akademi, Delhi, and In Search of Frozen Music (Nature Morte) in 2011. He also has several publications.

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Dr. Prof. Mamatha P. Raj is the Founder-Director of BMS College of Architecture, Bangalore. She has over 32 years experience in academics, research and the profession. She has published over 65 papers and presented at reputed national and international levels. She is on the editorial boards of prominent journals and has been guiding doctoral scholars under VTU Belagavi.

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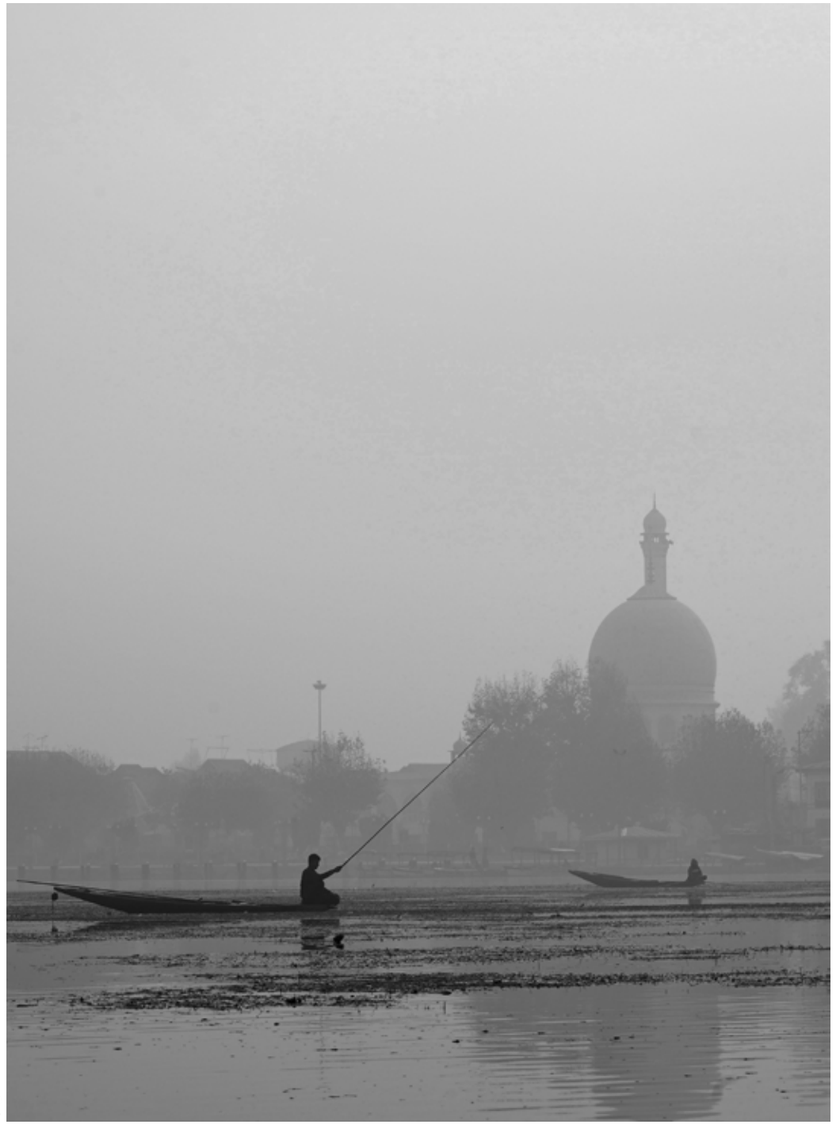
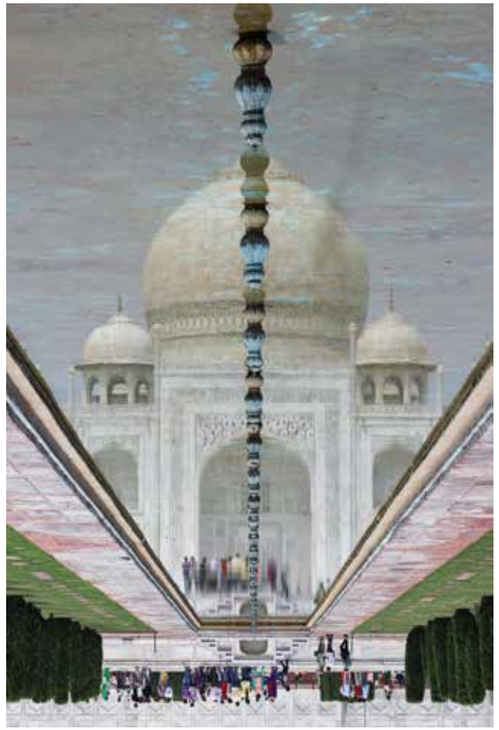
TRICOLOURED TRAIL!

Ar. Syam Sreesylam



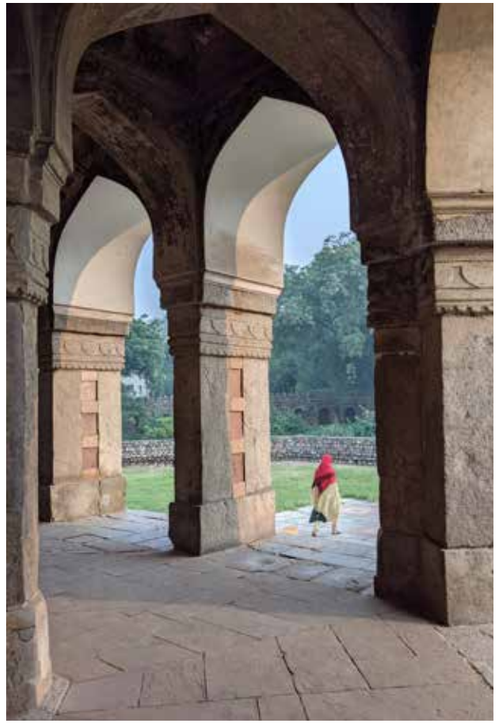
Early morning view from Dal Lake to Hazratbal Masjid, Kashmir

Inside Taj-UI-Masjid, Bhopal



Shot from any angle, seen from any side, the Taj Mahal's marbled facade looks splendid

A midnight shot from the Golden temple Amritsar.



Isa Khan’s tomb inside Humayun’s tomb complex, Delhi.

Winter morning at Dal Lake, Kashmir.

The magnificent Hawa Mahal.

Golden Temple, Amritsar

The Neolithic site of Burzahom.

Baleen whale skeleton at Thanjavur Palace.

All Images Courtesy: **Author**

Ar. Syam Sreesylam graduated from Calicut University in 2018. Although he is currently practising architecture, his area of interest lies particularly in architectural photography. He has collaborated with architects across Kerala and his photographs have been published on various noteworthy platforms.
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SKETCHES

Ar. Biju Balan

Handmade sketches always help in narrating the inexplicable and explicable theme of the concept. Visualization of the two-dimensionally drawn concepts is substantial in the design process. Incorporation of scale, massing, texture, solids and voids, colour etc., educe the artistic touch to architectural elements, a circuit to the blending of art in architecture. A sketches represents a handmade scribble which is finer, but not a finished work, but these architectural sketches owe a great part to the built form.

Aashramam, Mysore

entry for guruji

view from balcony of bedroom

Aashramam, Mysore

Residence at Beypore

Residence for Ambily

Residence for Dr. Vijayakumar

Residence for Mr. Bijesh

Residence for Mr. Shibin

Wayanad Wild Forest Lodge

Wayanad Wild Forest Lodge

Wayanad Wild Forest Lodge

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ERETZ YISRAEL

Ar. Gita Balakrishnan

Ancient Street of Cardo in the Jewish Quarter, Jerusalem

Israel, which translates to *Let God Prevail,* is bounded by Jordan on the east, Egypt on the south, Syria and Lebanon on the north and the Mediterranean Sea on the west, not to mention the West Bank or the state of Palestine and could have been a more than ideal example of peaceful co-existence. If only …..

This country, which is only 16 km across in some parts is an example of the power of coming together of a community of people, who although were of similar origin had little to do with each other, except for being part of a community that was being targeted for annihilation – no doubt a strong enough cause to build a prosperous country out of not much.

The landscape and the skyline of the cities of Israel provide variety. Be it the ashlar stone masonry finish of Jerusalem, hilly terrain of Haifa, Bauhaus influenced historical buildings of Tel Aviv or the modern approach of Beach City Eilat! These are the four cities that I visited in addition to the starkly different Bethlehem barely 9 Km away from Jerusalem in the Palestine State.

The saying *Pray in Jerusalem, Play in Tel Aviv and Work in Haifa* rang true to me when I visited in June of 2017 to be with my son Gaurav who was on an internship at the Technion University in Haifa. Having entered Jerusalem on the eve of Shabbath, one got to see the role religion plays in the lives of all here. Walking through the old city one saw the Armenian Quarter, Arab Quarter, Christian Quarter and the Jewish Quarter all living in close proximity and maintaining a good relationship with each other, although the Temple Mount which began as the sacred area of the Jews centuries earlier, now is the same for Muslims and hence is not accessible to non-Muslims. The Dome of the Rock is where Prophet Mohammed is supposed to have begun his night journey to heaven. This is considered to be the same spot by the Jews where Abraham offered to sacrifice his son in response to a call from above.

Our guide Mali, whose name means the Queen (Her actual name sounded like Malkin) walked us through Via Dolorosa; Via Dolorosa is the path Jesus Christ is supposed to have walked on the way to his crucifixion. We visited the legendary spot of the Last Supper, the point where Judas is believed to have betrayed Jesus. Mali recreated for us scenes, which we have seen many times over in different movies on Christ.

The West Wall is where the Jews mourn the loss of their temple. The city begins shutting down from noon on Friday for Shabbath and complete silence prevails on the roads. There are no buses or trains plying; no restaurants or stores are open. On Shabbath day we visited the historic city of Masada and floated on the Dead Sea. The story of Masada recorded by historian, Flavius Josephus who was earlier a Jewish rebel captured by the Romans, was made into a movie starring Peter O' Toole in 1981 – a moving story of how 900 Jews protecting the garrison at Masada chose to kill themselves rather than surrender. When we returned at 5:30 PM, Jerusalem was a silent city that underwent a transformation into a bustling city after 9 PM, which is when I had to stand in a queue to buy my dinner. The Jews are serious about their rest day and a few may even take offence if they find you violating their codes. It would be interesting to note that they do not use gadgets so even their

Old City of Jerusalem

Pavement from the Old City Jerusalem

Market in Old City Jerusalem

Western Wall Jerusalem

Jerusalem on Shabbath

home lighting, elevators etc., are on a timer on Shabbath. You are expected to cover your knees and shoulders when visiting places sacred to them and women are expected to wear skirts and not trousers.

Bethlehem, just across the border presented a very different picture and reminded us of any of the crowded areas of our country lined with shops selling sweetmeats for Ramadan. We were left to go across the border by Mali and find our guide, Ali there. On reaching, there was no sign of Ali for over twenty minutes. There were a few anxious moments since we were unable to communicate and to correctly locate our Ali. Finally, after some calls to and fro, we realized that John was deputed to pick us up instead and take us to Miriam our guide who was terrific. She showed us the Church of Nativity where Jesus is believed to have been born. The structure was under renovation and it was interesting for me, an architect to study how they were documenting the different processes of restoration, which was due for completion in 2018. We gathered that Christmas time here would be rather special. John turned out to be a funny guy who knew Sharukh Khan, Akshay Kumar and all the pretty ladies of Bollywood and even regaled us with some songs in his accented Hindi.

That Tel Aviv is a more relaxed place was clear to me from when our son, Gaurav landed in Tel Aviv in May and told us of the number of concerts around in town. This has earned it the moniker of Nonstop city. But my visit to the capital city, which is also known as the White City, for a day from my base at Haifa gave me a flavour of how this city was built. The architects who sought refuge in Israel fleeing persecution came from Germany, Poland, Belgium, Russia and brought along with them their style. Many of the stalwarts from Bauhaus or architects who worked with the Bauhaus giants also made this their home. Hence, Tel Aviv has the largest number of Bauhaus buildings in the world and in 2003, it was awarded the World Heritage site status by UNESCO.

The Bauhaus Walking Tour took me through some of these buildings built in Art Deco style adapting them to the local situation. Features such as large balconies, gardens with each home made a statement that they wanted to feel free after what they had been through. Patrick Geddes proposed a detailed city plan in 1925, which was implemented in 1938 albeit with many changes. The greenery one sees in the city and ease of navigation are results of his simple planning principles. Tel Aviv is supposed to be the only city in the world to have implemented most of Geddes' design principles.

Haifa on the other hand is a pretty hilly city, housing the Technion University, which is seen as the largest and best university of Israel and is almost at the border with Lebanon. Without realizing the toll, it would take on my limbs I chose to go for my run the first morning I was there and went a step further and did most of my sightseeing for the day on foot too – a total of 18 km. Next day onwards it was different though – I had learned my lesson and used the very user-friendly public transport most of the time. There must have been something special about this parcel of land for it to be sacred to so many religious faiths. The Bahai religion has its headquarters in Haifa and the Bahai temple with its gardens rolling down the Carmel hill are a sight to behold both by day and night. Haifa

Yad Vashem - The Holocaust Memorial, Jerusalem

Yad Vashem - The Holocaust Memorial, Jerusalem

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could be a base for those who want to make trips to the Golan Heights in the North, or the small towns of Caesaria or Akko.

Across another border from the beach town of Eilat at the Southernmost tip of Israel we set off to visit Petra via Aqaba, which shares the beaches of Red Sea from the Jordan side. After passport control and securing a visa for a day, we were met by another Ali, with no problems this time who was our guide for the day tour of Petra. After a 2-hour drive, we reached the historic ruins and there was a 4.4 km walk downhill with sights of the different tombs to see along the way. Bab El Siq is the canyon through which we walk to come out on the other side to catch the first glimpse of the *Treasury,* which is really the treasure of this complex. While it is a tomb, it got this name only because the locals thought the pot in the outer carving was hollow and held gold and gems. You would even see many gunshots on the façade, attempts of people trying to get to the treasure. After this point which is around half way through many prefer to take a ride on a camel or a donkey to the bottom which is where the common man lived. Most of these dwellings have been destroyed in earthquakes over time. Gaurav and I of course continued with walking while the 4 Americans with us took camels. We walked all the way back too and still reached earlier than the rest of the group. We also climbed a small hill to see some more elaborate tombs. Many of the structures are seeing signs of erosion and those like the Treasury, which are on the leeward side, are better preserved.

Eilat was the last trip on my holiday. Gaurav tried scuba diving and snorkeling and saw a lot since the fish and the reefs were around the area we were staying.

Kibbeh

Bahai Temple, Haifa

The food that I savoured on this trip was very satiating – the fantastic Falafel sandwiches or salads at most street corners with their array of pickles and sauces; dishes such as the Shakshouka, Kibbeh, Halva and others whose names I did not pick up were fantastic. We had dinner at an Arabic restaurant called Fatoush on the last day and the food reminded us of home. On the day that I was leaving, I learned from Google that Wadi Nisnas is the place for Baklavas and off I went after the dessert that my husband will do anything for!

I am not sure I will want to visit Israel again not because I have seen all that I have to see but because of the way Indians are treated at all security checks – whether it was at the Mumbai airport, during our flights to and from Eilat or the Jordan border. But I am sure they have their reasons for doing so. But don't let that deter you – one trip is definitely called for!

Photo Courtesy: **The author**

Ar. Gita Balakrishnan is a graduate from the School of Planning and Architecture, New Delhi. She completed her practical training at the Centre for Building Performance and Diagnostics at Carnegie Mellon University, Pittsburgh, USA. In 2002, she founded Ethos, an initiative to bridge the gap between students and professionals from the Architecture, Construction, Engineering and Design fraternity. Ethos will be completing 20 remarkable years in June 2022. To mark this milestone coinciding with 75 years of Independent India, she embarked upon a 1700km walk from Kolkata to New Delhi, to spread awareness on how good design can play a great role in changing lives. gita@ethosempowers.com

Art Deco in Tel Aviv

RAJASTHAN ARCHITECTURE FESTIVAL

HOSTED & CURATED BY
THE INDIAN INSTITUTE OF ARCHITECTS
RAJASTHAN CHAPTER

Report by Ar. Tushar Sogani,
Convener - Rajasthan Architecture Festival

The Rajasthan Architecture Festival held from 20th to 22nd May 2022, was one of the key initiatives by the Indian Institute of Architects. The event was aimed to become an annual celebration that travels to various other cities in Rajasthan, that strengthens engagement with stakeholders, and celebrates the architecture & culture of Rajasthan. The conglomeration was visited by more than 1500 architects from around 26+ different countries and created a dynamic and effective platform for the design fraternity. The festival witnessed the architecture & culture of Rajasthan through brainstorming sessions, workshops, installations, heritage walks, innovative exhibitions, cultural evenings & many more.

Arrival of Delegates & Guests

Grand Inauguration of Rajasthan Architecture Festival

Gala Dinner at Once Upon a Time at Bagh - Vidyadhar ka Bagh

Heritage walk - in Jaipur walled city - UNESCO world heritage site

Gala Dinner at Clarks Amer Hotel

Technical Sessions

Imagining A Re-Adaptive Future
Manish Chakraborti, Aman Nath,
Abha Narain Lambah
Dr. Abu Sayeed M Ahmed, Vinod Kumar MM

Expert Speaks -
Pankaj Dharkar

The Architecture of Democracy
Sanjeev Vidyarthi, Habeeb Khan,
Lalichan Zacharias, Jitendra Mehta
Vivek Bhole

Master Speaks -
Shirish Beri

Coalescing Modern Materials in a Traditional Terrain
Madhav Raman, Dipen Gada,
Sidhartha Talwar, Vivek Singh Rathore,
Khozema Chitalwala

Dialogue -
Prashant Sutaria in conversation
with Gita Balakrishnan

Architecture Transformation
Salil Ranadive, Rita Soh, Reza Kabul,
Rajesh Renganathan, Fahed Majeed

Master Speaks -
Gurjit Singh Matharoo

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Keynote session - Dato'Dr. Ken Yeang

Keynote session - Marina Tabassum

Art Installation Competition

Heritage Walk – Nahargarh Fort

ARCASIA Office Bearers Meeting

Book Launch

Architecture Quiz

Valedictory Function & Concluding Dinner

Technical Sessions

Adding Green' to the Sand
Qazi M Arif , Tan Szue Hann,
Yatin Pandya, Chitra Vishwanath,
Anu Mridul

Expert Speaks -
Alka Pande

Heritage under Threat
Kamalika Bose, Prof. K.T. Ravindran,
Dr. Abu Sayeed M Ahmed,
Kulbhushan Jain, Ravindra Gundu Rao

Master Speaks -
Sanjay Mohe

Evolution of Inherited Perception
Dean D'cruz, Vivek Gupta, Melvin HJ Tan,
Sandeep Shikre, Charanjit Shah

Expert Speaks -
Apurva Bose Dutta

Cities, protest, and Social Change
Sanjeev Vidyarthi, Sheila Sri Prakash,
Rahul Kadri, Naresh V. Narasimhan,
Chun Gyu Shin

Expert Speaks
Sebastian Zachariah

NEWSLETTER JUNE

IIA-Assam Chapter

IIA FOUNDATION DAY
celebrated by
The Indian Institute of Architects - Assam Chapter

The Indian Institute of Architects - Assam Chapter celebrated the Foundation Day of the Indian Institute of Architects on 12th May 2022 at the Greenwood Resort, Guwahati. The event saw a large gathering of architects of the state and it was sponsored by Everest Industries Ltd. The programme began with lighting of the auspicious lamp, followed by felicitation of dignitaries. Chairman Ar. H. K. Rajkhowa addressed the gathering focusing on the history of IIA and called for all members to come together with collective responsibility towards IIA and towards our profession to bring about the change and awareness that is required today in our society. Ar. Amalendu Bhuyan delivered an informative presentation on "Safeguarding Wetlands - the lungs of our cities, Examining the adequacy of the legislative framework for conserving Deepor Beel, Guwahati'. There was another presentation by Ar. Bikram Aditya Nath on 'Study on Multi Scalae Breakwater System for Riverbank Erosion'. The event concluded with a Vote of Thanks by Jt. Hon. Secretary Ar. Pankaj Phukan.

Chairman Ar. H. K. Rajkhowa addressing the gathering

Gathering of Architects on the occasion of IIA Foundation Day

Lighting of the Auspicious Lamp

NATCON 2021 at Hyderabad
attended by
The Indian Institute of Architects

Members of the Indian Institute of Architects - Assam Chapter attended the IIA National Convention 2021 held at HICC Hyderabad. Chairman Ar. H. K. Rajkhowa along with several other members of the chapter attended the meet. Ar. Sukanya Das from Assam Chapter was awarded the IIA Certificate of Merit 2021-2022 during the valedictory ceremony.

IIA-Chandigarh Chapter

"New Haryana Vidhan Sabha Building will be Disastrous for Chandigarh"

IIA Chandigarh Chapter writes to Home Ministry, CM, UT Administrator seeking immediate intervention to stall the project, which is a violation of Master Plan

The Indian Institute of Architects (IIA), Chandigarh Chapterhas expressed grave concern over the proposal to have a new building for Haryana Vidhan Sabha in Chandigarh. Senior functionaries of the IIA Chandigarh Chapter have shot a letter to the Home Minister, Chief Ministers of Haryana and Punjab and the UT Administrator,

stating that the proposed building is a clear violation of the city's master plan and any such move will be nothing but tinkering with Chandigarh's unique character.

In a press conference held at Chandigarh Press Club here today, S.D. Singh Chairman, IIA Chandigarh Chapter said, in the communication it has requested to consider several other options.

The idea of making new Vidhan Sabha will be against Master Plan of city and it may invite huge criticism at International level, he said, citing similar proposals like destroying green belt of mango trees, and Tata Towers project, in the past which led to their cancellation at the PMO level, causing a lot of embarrassment to the Chandigarh Administration.

Suid Bh form Chipeson of Chdih-Pujab Chpte said,Chandigarh is considered as one of the best experiment in Urban Planning and Architecture in India after Independence. Thousands of Indian and foreign architects visit Chandigarh and its Capitol Complex as tourists because of Iconic landmark buildings designed by legendary architect Le Corbusier.

He added, the whole world knows that Chandigarh's Master Plan is originally prepared by Swiss-born French Architect Le Corbusier which was followed in letter and spirit by then Punjab Government. Revised Chandigarh Master Plan-2031 was prepared by Chandigarh's Urban Planning Department and was approved by Chandigarh Administration and Union Ministry of Home, Government of India.

"Le Corbusier compared Chandigarh Plan with a human body where Capitol Complex consisting of Secretariat, High Court & Assembly Hall is "Head" of the human body. If Haryana will add new Assembly Hall, then Chandigarh will have two heads!", he said.

The proposal of building separate Vidhan Sabha within the boundary of city at different location is complete violation of original Le Corbusier plan and revised Master Plan of Chandigarh. It will destroy Corbusier's concept of city planning, Bahgasaid, adding, Chandigarh can appoint international jury consisting of eminent but independent architects and planners who have knowledge about Le Corbusier's work and philosophy to finally take the decision.

Sanjay Goel, Chairman, IIA, Punjab Chapter saidwhile giving different options said, "Haryana Government can plan to build a New Capital city of its own on some suitable site located in the centre of Haryana state which is easily accessible to residents of the state. The other option can be that Haryana Government can consider building only Capitol Complex on the outer skirts of some existing town of Haryana having Secretariat, Vidhan Sabha and its own High Court with other relevant facilities.

Goel said, "Le Corbusier originally planned Governor's Palace in Capitol Complex of Chandigarh. On the insistence of then PM, Pandit Jawaharlal Nehru, idea was dropped. But Corbusier was perturbed that this will spoil the composition of his Capitol Complex. Nehru advised him to replace it with another building so that his composition is not spoiled. Then Corbusier came with the concept of building Museum of Knowledge in its place which is lingering on from nearly 70 years. During International Conference held in Chandigarh in 1999, a mock façade of Governor's Palace was built on same site to highlight the urgency to build that structure by Internationally-acclaimed architects and planners. We recommend that Haryana can build that building and shift its 350 officials in new building. They can continue to use existing Hall in Vidhan Sabha plus new building as well. It will not only solve their problem, but rather help in completing Corbusier's dream project."

"Based onHaryana Government's factual data about present space requirement, efficient space planning with some minor changes can be explored. A series of low-height annexes were added on rear side of High Court to cope with growing demands of High Court. Likewise some additional nicely-designed low-height structure can be added on rear side of existing Assembly Hall", he said adding, Haryana Government and Punjab Government can use same Hall by segregating the dates of their sessions.

Discussions of having independent high court of Haryana and shortage of space in main Secretariat are also going on from years. Haryana can build its own High Court in the existing Capitol Complex area as well as Secretariat but without disturbing the core area. But design of Le Corbusier's buildings can be repeated, Anju Bala, Joint Secretary of IIA concluded.

IIA-Haryana Chapter

ARCHITECTURE CONCLAVE AT PANCHKULA

The Panchkula Centre of IIA Haryana Chapter organised an Architecture Conclave on 4th June 2022, on the occasion of the eve of World Environment Day 2022, at Hotel Holiday Inn, Panchkula. The theme of the Conclave was 'Haryana Building Code - Building Sustainable Infrastructure'. The program was organised in association with PHD Chamber of Commerce and Industry. Mr. Devender Singh, IAS,

Additional Chief Secretary to Government, Haryana, Town & Country Planning and Urban Estates Department was the Chief Guest on the occasion, while Mr. Ajit Balaji Joshi, IAS, Chief Administrator, Haryana Shehri Vikas Pradhikaran (HSVP) and CEO Panchkula Metropolitan Development Authority, was the Guest of Honour. The event was graced by Ar. Hem Raj Yadav, Chief Architect HSVP, Mr. Naveen Sardana, Chair International Affairs Committee for South Asia PHDCCI and Mr. Pranav Gupta, former Chair, Haryana State Chapter PHDCCI.

Speaking on the occasion Mr. Naveen Sardana emphasized the importance of sustainability in the infrastructure sector, specially because of the significant role it plays in economic growth and development and in terms of employment it provides. Mr. Devender Singh, IAS, explained the necessity of zero discharge campuses so as to reduce the burden on physical infrastructure. He said the Haryana Government is promoting ECBC compliance for all commercial and institutional buildings. He welcomed the initiatives of IIA Haryana Chapter and assured that various issues raised by IIA shall be duly addressed. In his theme address Ar. Anil Walia, Imm. Past Chairman IIA Panchkula Centre, talked about the various measures being taken towards environmental sustainability. Ar. Hem Raj Yadav presented the scheme for affordable housing being developed under PMAY in the state. He demonstrated how cost effectiveness and energy efficiency can be brought into buildings through design. Ar. Ram Kumar Barwal, Chairman IIA Panchkula Centre and Senior Town Planner thanked PHDCCI for the collaboration in organising the Conclave. He said that sustainable design practices and adherence to codes for energy efficiency must be adopted by all.

Ar. Punit Sethi, Chairman IIA Haryana Chapter, greeted the fraternity on the occasion of World Environment Day. Through a very elaborate key note presentation on 'A Profession Committed To Sustainability', he urged all architects and planners to recognize that green design is an opportunity and to commit ourselves as professionals towards achieving sustainability by creating a balance among economic, social and environmental factors. Mr. Ajit Balaji Joshi, IAS informed the gathering that Haryana government is developing 400 acre Sector 29 in Pinjore Town as the 1st Carbon Neutral Sector in the state. He also talked about the urban forestry programs being undertaken in the state. He welcomed the feedback given by the Chapter regarding various issues being faced by architects and said that his department is taking measures to streamline online approval systems and assured that representatives from the Chapter shall be duly involved in the process through regular meetings and interactions.

Mr. Pranav Gupta proposed a vote of thanks. The program was conducted by Ar. Sukumar Jeirath, Vice Chairman IIA Panchkula Centre and was attended by about 100 people from various cities of Haryana as well as Chandigarh and Punjab. Earlier in the day a combined meeting of the Executive Committees of IIA Haryana Chapter and its three Centres and four Sub-Centres was held. This is second such meeting in the ongoing term.

Mr. Ajit Balaji Joshi, IAS, addressing the gathering.

IIA-Punjab Chapter

Spreading awareness on better plumbing details and sustainable waste management –
3rd Architects Meet IIA JALANDHAR
Date: 11th June 2022
Venue: Hotel Best Western, Jalandhar

Dr. Ar. Atul Kumar Singla (Chairman Jalandhar Chapter IIA, Chief Architect LPU & Founder, IDEARCH Architects) has always endeavored to educate students and clients on simple Sustainable measures and products that can be incorporated into daily lives. Redefining the same with better detailing through plumbing systems IIA Jalandhar partnered with Prince Pipes and Fittings and the Lovely School of Architecture and Design (LSAD), Lovely Professional University (LPU), for the 3rd Architects Meet, themed 'Sustainable Living'. The event was attended by prominent Architecture professionals, LPU faculty, students and representatives from Prince Pipes and Fittings. Nihar Chhera (VP, Strategy, Prince Pipes) appreciated the architects of Punjab on their initiative to spread awareness and echoed the dire need for sustainability in plumbing products. Ar. Meenal Verma, expert and pioneer in waste management strategies, awarded at the National level emphasized the goals of sustainable development and no waste homes. She educated the architects on the details of rainwater harvesting systems and segregation of waste as the simple measures that can start a revolution in Sustainable living for Punjab.

IIA Patiala Sub Center- Seminar on Architectural Education globally
Date: 13th June 2022
Venue: Patiala

An overwhelming audience of 60 Architects from Punjab, prominent speakers Ar. Prabhjot Kaur, Ar. R.S. Sandhu, Ar. L. R Gupta and IIA members attended this seminar which was held in collaboration with Prince Pipes and Fittings. Ar. R.S. Sandhu while delivering the address highlighted the need for such seminars focusing on raising awareness of architectural education. Ar. Prabhjot, retired principal and keynote speaker for the event spoke of how to diminish the gap between education and profession through validation in curriculum and pedagogy. Ar. L.R. Gupta reiterated the importance of working together for the betterment of society. Ar. Pritipal Ahluwalia encouraged the young generation of enthusiast architects to participate more in such events. Others present on the occasion were Ar. Lokesh Gupta, Ar. Rakesh Arora, Ar. Jaswinder Singh (Chandigarh), Ar. Anmol (Bathinda), Ar. Sanjay, Ar. Akanksha (Ludhiana), Ar. Rajnish Walia, Ar. Jeewan Gupta and Ar. G.S. Rehsi.

City architects criticize Haryana Assembly building plan
Date: 22th June 2022
Venue: Press Conference at Chandigarh

The IIA Punjab Chapter Chairman Ar. Sanjay Goel along with former Chairperson IIA, Ar. Surinder Bahga criticized the idea of making a New Vidhan Sabha for the Haryana government on 10-acre land of Chandigarh. Highlighting its absence in the Master Plans of Chandigarh, Ar. Bahga appealed to all stating how it shall ruin the concept of Chandigarh. Ar. S.D. Singh, Chairman IIA added that it will also spark international criticism due to the current heritage status of Chandigarh. In the further course of events, the senior functionaries of IIA have also appealed in writing to the government for the same.

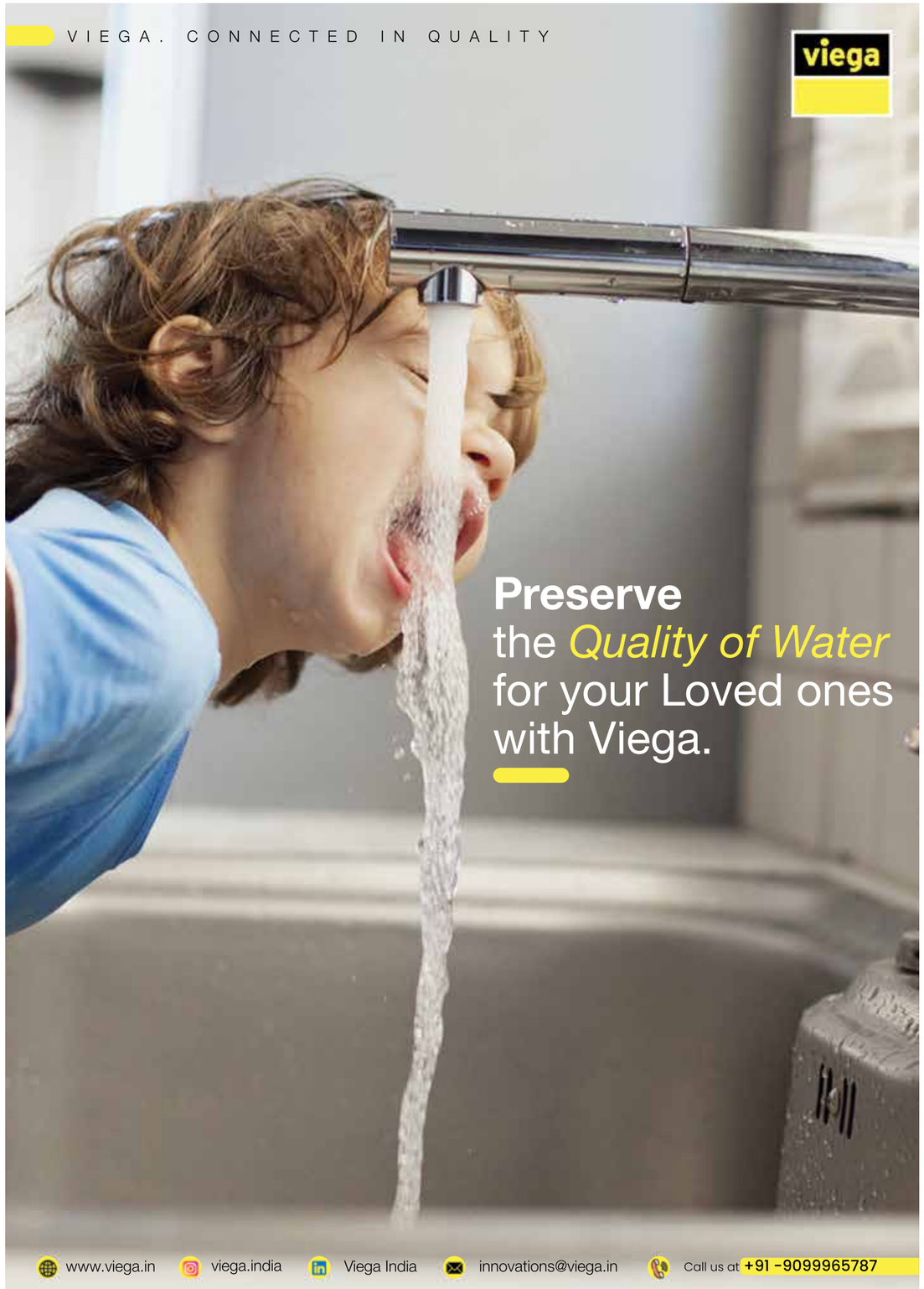
WELCOME NEW IIA MEMBERS

7th Council Meeting Held at Hyderabad 14th May, 2022.

Sr. No.	Associate to Fellow	Memb. No.	Place
1	Ar. Sangita D Kuvalekar	F16732	Talegaon
2	Ar. Kiran Gandhi	F18559	Panchkula
3	Ar. Surender Kumar	F15878	Haryana

Sr. No.	Dirct Fellow	Memb. No.	Place
1	Ar. Meetu Asokan	F25423	Kerala
2	Ar. Abhishek Malhotra	F25424	Gurgaon
3	Ar. Vikas Kumar Goel	F25425	Uttar Pradesh
4	Ar. Anand Khatri	F25426	Noida

Sr. No.	Assoicate	Memb. No.	Place
1	Ar. Samapika Pattanaik	A25427	Odisha
2	Ar. Satyajit Nayak	A25428	Odisha
3	Ar. Dinesh P	A25429	Tamil Nadu
4	Ar. Jibanananda Sahoo	A25430	Odisha
5	Ar. Fauzia Tasnim	A25431	Odisha
6	Ar. Subhashree Subhasmita Roy	A25432	Odisha
7	Ar. Saujanya Rout	A25433	Odisha
8	Ar. Monalisa Pani	A25434	Odisha
9	Ar. Achyut Govind Jayalaxmi Joshi	A25435	Karnataka
10	Ar. Surbhi Vishram Shirsat	A25436	Karnataka
11	Ar. Bijayalaxmi Swain	A25437	Odisha
12	Ar. Rakhi Bhagat	A25438	Odisha
13	Ar. Nimit Nitin Mehta	A25439	Telangana
14	Ar. Radhika Tyagi	A25440	Telangana
15	Ar. Vikas Bapurao Ranjana Padalkar	A25441	Kalyan
16	Ar. Harini V	A25442	Telangana
17	Ar. Neha Garg	A25443	Telangana
18	Ar. Laharika S Reddy	A25444	Telangana
19	Ar. Anju Reshma M	A25445	Telangana
20	Ar. Masimukkala V Venkateswararao	A25446	Telangana
21	Ar. Nakirikanti Mounika	A25447	Telangana
22	Ar. Abhilash C V	A25448	Thiruvananthpuram
23	Ar. Sunil Nishad	A25449	Nashik
24	Ar. Akanksha Nayan Panchal	A25450	Surat
25	Ar. Rahul Mehulbhai Dalal	A25451	Gujarat
26	Ar. Jitendra Vasantrao Lonkar	A25452	Mumbai
27	Ar. Pooja Narendra Chhallani	A25453	Lonavala
28	Ar. Lajaree Vitthal Thosar	A25454	Lonavala
29	Ar. Aditi Sampat Pandhare	A25455	Talegaon
30	Ar. Priyanka Anil Lokhande	A25456	Pune
31	Ar. Rutusha Bharat Ladha	A25457	Pune
32	Ar. Namrata Pratap Singh Kataria	A25458	Pune
33	Ar. Harshada Sunil Vazarkar	A25459	Pune
34	Ar. Neha Purushottam Anwane	A25460	Pune
35	Ar. Priyanka Ashok Gajbhar	A25461	Pune
36	Ar. Ajay Bhaskar Harale	A25462	Pune
37	Ar. Aparna Satish Gawade	A25463	Lonavala
38	Ar. Gouri Mohan Jadhav	A25464	Talegaon
39	Ar. Madhura Sanjay Dhamdhere	A25465	Talegaon
40	Ar. Vijay Chaburao Dabhade	A25466	Talegaon
41	Ar. Shrikant Kailash Vidya Kutwal	A25467	Talegaon
42	Ar. Bhagyashri Anil Kulkarni	A25468	Pune
43	Ar. Dnyanesh Bhaskar Bhegade	A25469	Talegaon
44	Ar. Chinmay Chandrakant Majgankar	A25470	Talegaon
45	Ar. Mangesh Nitin Joshi	A25471	Talegaon
46	Ar. Srushti Gorakh Kumbhar	A25472	Talegaon
47	Ar. Jyotsna Mayee Sahoo	A25473	Odisha
48	Ar. Manish Kumawat	A25474	Jodhpur
49	Ar. Prasad Pradeeprao Dalal	A25475	Pune
50	Ar. Mayur Dilip Rajgurav	A25476	Pune
51	Ar. Rahul Bhalchandra Dalvi	A25477	Pune
52	Ar. Amey Nitin Wadekar	A25478	Pune
53	Ar. Priyanka Kaustubh Bhegade	A25479	Talegaon
54	Ar. Rajesh Devji Rathod	A25480	Talegaon
55	Ar. Ajay Dashrath Bawale	A25481	Talegaon
56	Ar. Ann Maria James	A25482	Kerala
57	Ar. Rajendra Sharma	A25483	Jodhpur
58	Ar. Parth Ajay Bawale	A25484	Talegaon
59	Ar. Pratik Manohar Bhagwat	A25485	Talegaon
60	Ar. Pranav Lahoty	A25486	Kota
61	Ar. Nishchay Navin Bhurat	A25487	Lonavala
62	Ar. Roshan R Prabhu	A25488	Kannur
63	Ar. Rekha Bhaskaran	A25489	Uttar Pradesh
64	Ar. Rohit Yadav	A25490	Haryana
65	Ar. Santosh	A25491	Haryana
66	Ar. Rupali Bansal	A25492	Hisar
67	Ar. Artha Mondal	A25493	Jharkhand
68	Ar. Rohit Panda	A25494	Odisha
69	Ar. Satyanarayana Mada	A25495	Telangana
70	Ar. Amandeep Singh	A25496	Punjab
71	Ar. Ruma Bhatt	A25497	Odisha
72	Ar. Debashreeta Debabarni	A25498	Odisha
73	Ar. Mriganabh Sarma	A25499	Assam
74	Ar. Kiran P	A25500	Calicut
75	Ar. Subhra Mohanty	A25501	Odisha
76	Ar. Pratyasha Patra	A25502	Odisha
77	Ar. Subhankar Saha	A25503	Odisha
78	Ar. Monalisa Panda	A25504	Odisha
79	Ar. Jaligama Meghana	A25505	Telangana
80	Ar. Jaskirat Singh	A25506	Uttarakhand
81	Ar. Bhavna Bhargava	A25507	Telangana
82	Ar. Simran Chakarvarty	A25508	Haryana
83	Ar. Aghil Nasim K	A25509	Kerala
84	Ar. Shibil T	A25510	Kerala
85	Ar. Jinto Kuriakose	A25511	Kerala
86	Ar. Fayas M	A25512	Calicut
87	Ar. Shebin George	A25513	Kerala
88	Ar. Stephen Cyriac Paimpilly	A25514	Kerala
89	Ar. Neha Miria Ninan	A25515	Cochin
90	Ar. Anuj Gupta	A25516	Haryana
91	Ar. Richa Gupta	A25517	Haryana
92	Ar. Melanie Carol Letitia Dsouza	A25518	Mangalore Manipal
93	Ar. Nishith D Ammunje	A25519	Mangalore Manipal
94	Ar. Akshaya Lakshmi Narsimhan	A25520	Karnataka
95	Ar. Sanjeev Pareek	A25521	Rajasthan
96	Ar. Prajisha K	A25522	Kerala
97	Ar. Chandni Tandon	A25523	Rajasthan
98	Ar. Sneha Sridhar	A25524	Karnataka
99	Ar. Sahil Bazari	A25525	Rajasthan
100	Ar. Jenil Khatod	A25526	Udaipur
101	Ar. Raja Singh	A25527	Northern
102	Ar. Ruma Kalla	A25528	Telangana
103	Ar. Vivek Kalla	A25529	Telangana
104	Ar. Arpit Khandelwal	A25530	Indore
105	Ar. Sherin Kadeeja T	A25531	Calicut
106	Ar. Sanjay Bhandari	A25532	Andhra Pradesh
107	Ar. Chandarani Shankarrao Patil	A25533	Kolhapur
108	Ar. Pratik Gupta	A25534	Indore
109	Ar. Deepika Yadav	A25535	Gurgaon
110	Ar. Anand Maroo	A25536	Indore
111	Ar. Zoheb Ali Khan	A25537	Noida
112	Ar. Shriyansh Jain	A25538	Rajasthan
113	Ar. Basil V K	A25539	Kerala
114	Ar. Mullai J	A25540	Thanjavur
115	Ar. Vithya Lakshmi S	A25541	Tiruchirappalli
116	Ar. Uma Mouthiga E	A25542	Tamil Nadu
117	Ar. Namita	A25543	Northern
118	Ar. Vineetha P S	A25544	Kerala
119	Ar. Hyder Ahmad Khan	A25545	Jammu & Kashmir
120	Ar. Harsini Suvaytha A	A25546	Chennai
121	Ar. Gunda Harish	A25547	Andhra Pradesh
122	Ar. Aditi Sharma	A25548	Rajasthan
123	Ar. Apurva Pal	A25549	Chandigarh
124	Ar. Mayurkumar Babulal Prajapati	A25550	Ahmedabad
125	Ar. Tapan Navneetbhai Patel	A25551	Gujarat
126	Ar. Ujas Gautamkumar Patel	A25552	Gujarat
127	Ar. Shiv Kumar	A25553	Northern
128	Ar. Kanuri Brahmam	A25554	Visakhapatnam
129	Ar. Abhayakumar N. S	A25555	Thiruvananthpuram
130	Ar. Prachi Shringi	A25556	Rajasthan
131	Ar. Pavithra SriramAr. Pavithra Sriram	A25557	Tamil Nadu
132	Ar. Balasubramani Ranganathan Dikshit	A25558	Mumbai
133	Ar. Radhika G	A25559	Karnataka
134	Ar. Envita Das	A25560	Odisha
135	Ar. Nijo M George	A25561	Kerala
136	Ar. Veepa Bhavesh Jariwala	A25562	Nagpur
137	Ar. Shanu Soni	A25563	Rajasthan
138	Ar. Jishnu Sreeram T A	A25564	Kerala
139	Ar. Sethulakshmi M	A25565	Calicut
140	Ar. Harsha Shamsu	A25566	Kerala
141	Ar. Narala Srinivas	A25567	Andhra Pradesh
142	Ar. Akhil Augustine	A25568	Kannur
143	Ar. Rishi Kishor K R	A25569	Kannur
144	Ar. Soumini R	A25570	Calicut
145	Ar. Addala Pedaveeracharyulu	A25571	Andhra Pradesh
146	Ar. Nattam Oswani Hima Varsha	A25572	Andhra Pradesh
147	Ar. Srinivas Bathula	A25573	Andhra Pradesh
148	Ar. Chintalapudi Samanth	A25574	Andhra Pradesh
149	Ar. Suruchi Sanjay Patil	A25575	Nashik
150	Ar. Juby Minto John	A25576	Gurgaon
151	Ar. Monika Priyatosh Bhosale	A25577	Kolhapur
152	Ar. Yarramsetti Durgaprasad	A25578	Andhra Pradesh
153	Ar. Vishnu T V	A25579	Kerala
154	Ar. Alka Sobhi P M	A25580	Calicut
155	Ar. Anirudha Biswas	A25581	Odisha
156	Ar. Sandip Ravindra Patil	A25582	Ahmedabad
157	Ar. Joseph Paul T	A25583	Thrissur
158	Ar. Narasimha Murthy A	A25584	Andhra Pradesh
159	Ar. Manogya Gupta	A25585	Indore
160	Ar. Rupali Khatri	A25586	Rajasthan
161	Ar. Gummadi V V Ramana	A25587	Andhra Pradesh
162	Ar. Yashika Sharma	A25588	Rajasthan
163	Ar. Himani Sabharwal	A25589	Hisar
164	Ar. Thamilaresen E M R	A25590	Tamil Nadu
165	Ar. Priyadharshini S	A25591	Tamil Nadu



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RPS-06/2022

33rd JK AYA shall open for participation for sending entries From 1st January, 2023.

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For Award Information :-

Please Contact Award Secretariat :

RANA PRATAP SINGH
(Administrator JK AYA)

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