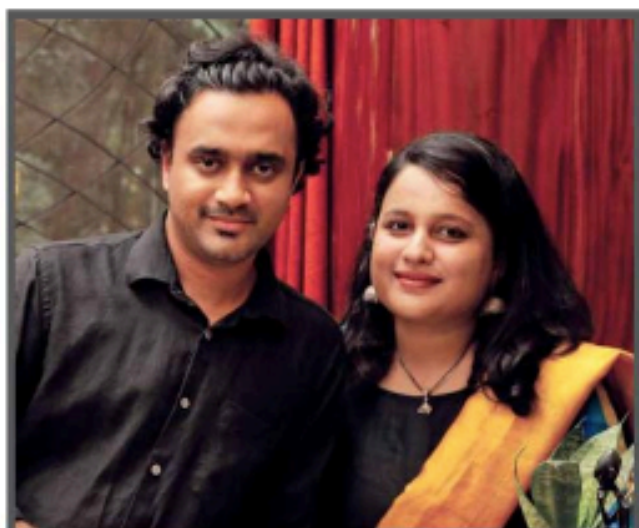


#SRRisingStars

SURFACES REPORTER'S

RISING STARS

AJAY ABEY & TARA E PANDALA, DIRECTORS, CENTRE FOR SUSTAINABLE BUILT AND NATURAL ENVIRONMENT (C.S.B.N.E.), KERALA



Ajay Abey & Tara E Pandala
Directors, C.S.B.N.E., Kerala

Centre For Sustainable Built and Natural Environment, C.S.B.N.E, as the name suggests, is a practice that caters around the Designers of biodiversity inclusive sustainable environment. With renowned Architect, Urban Designer and Heritage Conservator, Eugene Pandala as their Mentor Director, Ajay Abey and Tara E Pandala are working under his able guidance to design abodes that are green, using local materials and vernacular technologies. Ajay has Masters in Urban Design from National University of Singapore and has fifteen years of experience in Architecture, Master planning and Urban Design in India and Singapore. Tara Pandala is an Urban Design post graduate from CEPT Ahmedabad. Tara has been handling design concept development and Interior design wing of C.S.B.N.E. and also involved in academics.

<https://www.csbn.e.com>

S Tell us how you started and decided to collaborate.

Our learning and exposure in the field of architecture were in different domains. While Tara was accustomed to the practices of residential architecture, I had the opportunity in the commercial architecture and large-scale master planning consultancy practices. So we both decided to put together our experiences and start afresh with a small entity where we could practice and perfect our learnings and establish a direction in which we can take forward our architectural philosophy. We are also associated with SCMS School of Architecture, Kochi, Kerala where we believe in enlightening young minds to sustainable practices.

S Tara, what has been some of your greatest learning from your father?

My father (Ar Eugene Pandala) has presented a parallel paradigm to the world wherein a bio-diversity inclusive approach in architectural design can deal with the present issues of sustainability. The response he demonstrated through his projects has thrown light to young practitioners like me to decide upon the values we ought to follow in the realm of architecture. Through our small attempts, I was trying to learn from him and the fact that he constantly updates his knowledge base is the greatest learning I had from my father.

“ For us, every building is an artwork where we collaborate with craftsmen and local artisans. ”

S Tell us about your process of material selection. What are some of the local materials, techniques and crafts you love to work with?

Natural materials and local techniques have always fascinated our methods of architecture. We believe **buildings are like mushrooms that sprout from the natural context where they belong to.** We prefer local material as we explore mud, stone, sand, bamboo and wood in various context appropriately. The learning we aim is about the techniques through which we can explore these materials and the physics of the material application in various climate and context. We would like to encourage the local artisans and craftsman through our projects. We believe in creating a platform to enhance their capabilities and curate their work through our projects. For us, every building is an artwork where we collaborate with craftsmen and local artisans.

S Green ratings are universally accepted as the set norms for creating environment-friendly architecture. Do you agree?

We do not believe in ratings. A universal standard guideline may be effective to create awareness and it helps the journey towards a sustainable future. However the rating system in its present form, is not affordable to common people and we believe that the sustainable ratings have to be affordable also. Through our projects, we try to highlight the possibility of affordable and sustainable techniques using vernacular principles and cost effective materials and indigenous techniques.

S What are your thoughts around cost-effective sustainable architecture?

Natural Materials, Industrial byproducts, old and reusable materials, waste products. It's not about what materials we should use; instead how we use it. How to make structures lighter and resource friendly? We Have demonstrated in our project on how to construct a single family house by saving more than 60% of materials than a conventional process.

S Which are some of your milestone projects?

Every project irrespective of its scale, is a milestone. There are no specific milestone achievements in our small world of architecture. However **"The House of Hope"** and **"The House of Progression"** are the two projects where we have explored our application of sustainability principles. These projects also helped us to set a vocabulary for our practice.



“ We do not believe in ratings. A universal standard guideline may be effective to create awareness and it helps the journey towards a sustainable future. However the rating system in its present form, is not affordable to common people and we believe that the sustainable ratings should be affordable too. ”

S What are your upcoming projects?

We believe in exploring every project to its fullest and within the capacity what we have. We have committed for projects in the diverse fields of hospitality, institutional etc, where we have the opportunity to do what we believe in. In residential category, we have projects ranging from affordable sustainable to premium sustainable where we can explore the principles irrespective of the scale of the project.

S Do you feel, there is any gap in the Indian Architectural Education?

In Indian architectural realm, there is a scenario of arbitrary choices owing to the nature of social systems around us whereas in an international arena, there is always a need to rationalise every small decisions you would come across. This makes you more committed to the specification and details of execution as there is liability associated with every decision you make. This system makes every public or private project answerable to the context and the nature where it belongs to. So our design pedagogy shall emphasize the need to rationalize the decisions philosophically and technically.

S What defines and differentiates Ajay and Tara's work.

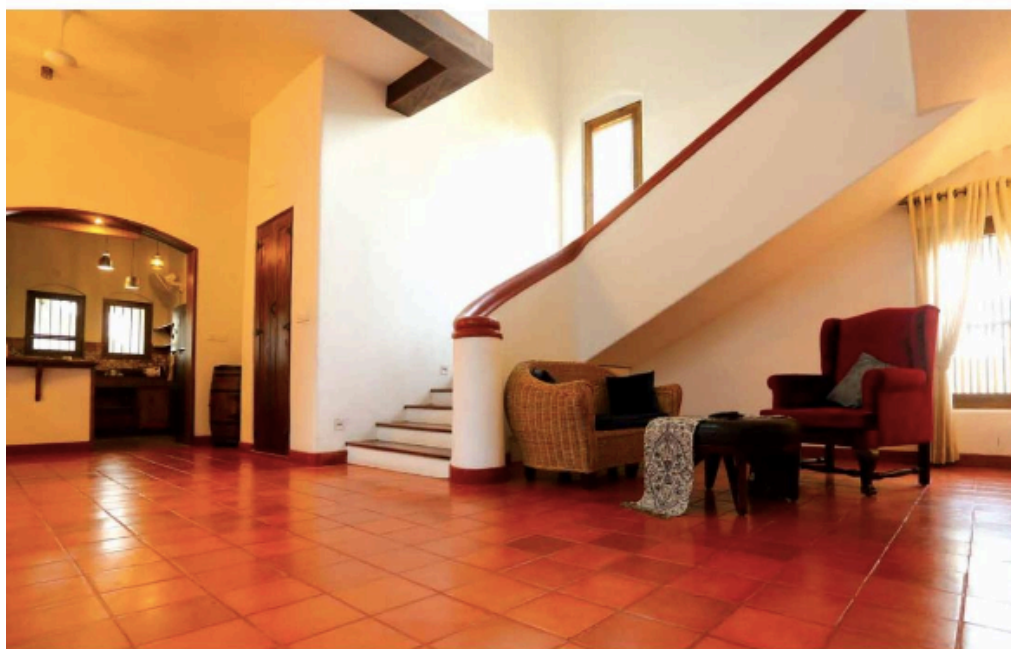
We attempt to create built fabric that is true to the nature where it belongs to. The built spaces compliment the nature around it and thereby enhance the liveability of the space. We would like our projects to cater to all sections of society and meet the aspirations they have about the built space they live in. So we believe in a diverse and inclusive approach.

“We would like our projects to cater to all sections of society and meet the aspirations they have about the built space they live in. So we believe in a diverse and inclusive approach.”

S Your Special message for SURFACES REPORTER.

We are delighted and thankful to SURFACES REPORTER for the opportunity to spread our message. Media can do a lot in sending the message to general public and create awareness on climate change and the need for sustainable built practices. You could also play a pivotal role in encouraging budding architects, students and established practices to realise the need of the hour and setting up their philosophy to address the climate change scenario. If you are able to encourage people to save building resources through your inspirational writing, it can bring about immense resource saving and reduction in carbon foot print in the built environment across the geography.

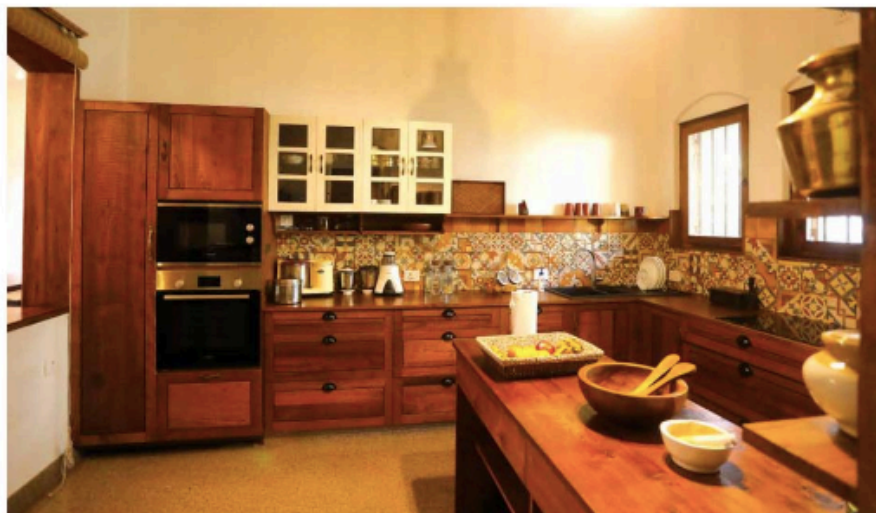
THE HOUSE OF PROGRESSION A TROPICAL ABODE



The art of space engages the mind as one explores through **Madhavam**, the bungalow located in scenic neighbourhood of Kumarapuram, on the outskirts of Trivandrum city. Madhavam creates a canvas to engage "movement in space".

Dance and Architecture joined together

The house is designed for an artist couple. Dance and Architecture joins together in the process of creating spatial layout. Space creation primarily embodies a process of self exploration and creation. Since movement creates space, a realisation of how the spatial flow enhances the inner capacity of performer was the key to design the space. The design creates a built environment conducive to capture the inclination of couple in drama and dance. Space configuration enlists a journey from outside to inside through a series of thresholds of varying degrees of privacy. The relation between private and public spheres is one of the important aspects that define the social qualities of everyday life.



The bungalow sits on a narrow site of 12 M frontage with a spatial segregation capturing varying degrees of privacy and creating rhythmic movement in space. The design emphasises on the spatial progression through form, volume, texture, colour, light and design elements. The project "A Premium Sustainable Built Environment" follows the principles of climate, culture and context.

Since the inmates are celebrities with large inclusion in the social sphere, the border of this interaction is a key element that can provide balance and well-being in the individual's social and personal life. This boundary is well defined in this context to create balance through thresholds of semi open spaces. The bungalow sits on a narrow site of 12 M frontage with a spatial segregation capturing varying degrees of privacy and creating rhythmic movement in space. The design emphasises on the spatial progression through form, volume, texture, colour, light and design elements. The project "A Premium Sustainable Built Environment" follows the principles of climate, culture and context.

Salient features of the project:

1. Weaving the inside and outside seamlessly to establish the connect with nature.
2. Emphasis on natural and less energy intensive building material.
3. Multilayer and light weight roofing system to assist natural convective cooling and enhance the spatial volume.
4. Rustic and down-to-earth interiors with high volumes to enhance the spatial experience.
5. Varying regional cultural influences of time and style is complimented with a very unique eclectic style of design.
6. Emphasis on landscape with native species of flora.
7. The built form mushrooms out of the landform as if it was pre-existing in the space and never alienates the natural or cultural history of the place.
8. Bio inclusive approach enables the spaces to respond to the functional needs through nature inclusive solutions.



HOUSE OF HOPE AN 'AFFORDABLE' GREEN HOUSE

House of hope

The climate change and affordable housing are inseparably linked and also in close parity with the social, economic and ecological well-being of the nation. The current practices of 'Green certified Housing' is an unaffordable model for the masses.

A house full of hope

This project illustrates a sustainable model that can be adopted across all regions viz, flood plains, hot arid and hot humid zones, cold zones and earthquake zones. This prototype is also a scalable model which can be followed for both low-income housing and bungalow type of premium housing. The highlight of the sustainable affordable prototype is that it consumes 67% less concrete, 75% less steel and no rubbles as compared to conventional house typology of similar scale.

A new methodology of construction is employed in this house which is Energy Efficient-Climatologically appropriate-culturally and contextually relevant-uses reused and economical and ecofriendly materials. The new typology attempts to change both outcomes and process involved in the conventional house building methods and holistically addresses the sustainability and affordability of single-family housing units. The innovative technological solutions introduced in the new typology are listed here.

1. Resource friendly Foundation systems and utilitarian stilt floor

By implementing a new method of foundation system, the entire footprint of the building is raised on stilt columns, made accessible and put to use for cattle shed, poultry, fishpond, and dog kennel. The cooler earth in the semi-accessible footprint will serve as a cold air reservoir to assist convective passive cooling for the built form.

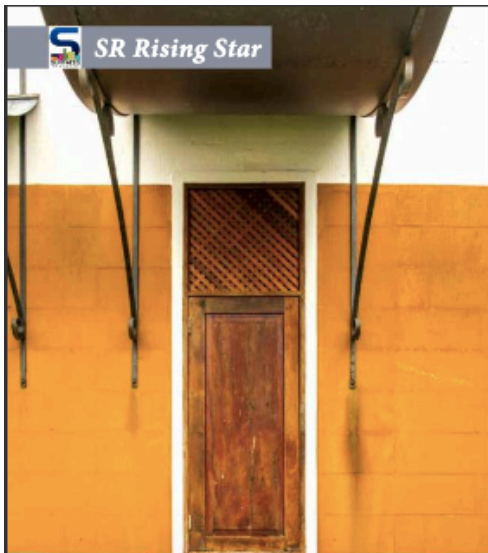
2. Rib and Skin shell slab system

An innovative skin shell slab system which requires only 1.5 inch Concrete bed saves the resource by 60% in the construction of slab. The new shell slab system is light weight and saves considerable load on the foundation and is sufficient to manage the conventional loading on a residential structure. The Shell slab infill is made with non-degradable solid waste such as plastic, glass, etc. Resource saving of construction materials and re-use of waste materials are emphasized in the process.

♦ No formwork is required.

♦ The thickness of concrete can be considerably reduced to only 1.5 inch saving cement/sand and aggregate.

♦ The use of GI metal mesh instead of steel Reinforcement bars reduces weight as well as cost and conserves resources and energy.



“A new methodology of construction is employed in this house which is Energy Efficient-Climatologically appropriate-culturally and contextually relevant-uses reused and economical and ecofriendly materials”

- ◆ Cement, sand, and water usage can be reduced by up to 60%.
- ◆ A single mason and two helpers can cast 1000 sq. ft in 2 days' time reducing labour costs.
- ◆ The technology can be easily taught to local artisans.

3. Lightweight masonry system

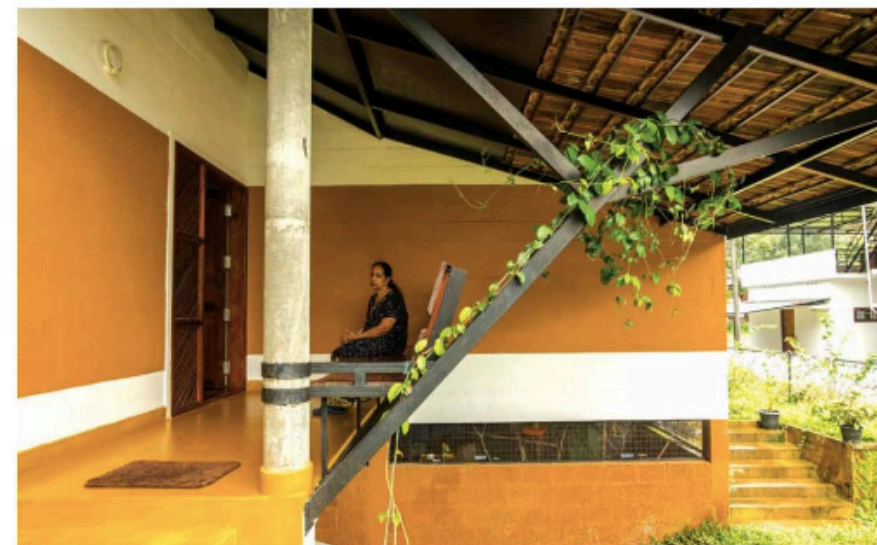
The walls are built of lightweight aerated concrete blocks made up of fly ash, a by-product of industry. AAC blocks require no water curing on site so as to save the water resources. Lintels are made with reinforced AAC blocks and RCC sunshades are avoided. Metal Chajjas are used to save resources in concrete and steel. Metal Chajjas are lightweight and can be fabricated and installed swiftly. Since these blocks are easy to cut with the brick cutter the plumbing and electric conduit could be easily laid beforehand.

4. Multilayer roof system

The roof of the structure is made of multilayer lightweight steel fabrication and futureproofing for solar panel installation is already accounted in the design details. The 3 cm air gap between the reused terracotta tile and the roof sheet assists in convective cooling and keeps the structure cool throughout the hot summer.

Qualities/benefits of multi-layer roofing:

- ◆ Reduces heat emission and cools naturally through convective process.
- ◆ Lightweight and hence the structural expenses are lower.
- ◆ Convective cooling is facilitated due to the large volume and the additional span achieved through a lightweight roof. The interiors are much cooler compared to a conventional technology house.
- ◆ Recycling and reuse made possible through the use of old terracotta tiles as roof texture.



- ◆ GI roof structure and fabrication can future proof the structure for solar panel installation.
- ◆ The stainless-steel water tank provides better structural efficiency and improves water quality.

5. Cost-effective and environmentally friendly finishes

Masonry walls are mud washed which retains the property of masonry as breathable walls and gives a chemical-free surface coating. The windows and doors are made out of thin layers of wooden sheath. Only plantation wood is used considering the replenishable aspects of wood in construction. Deviating from the conventional style of openable glass windows, stainless steel insect-proof mesh was used as window frames which in turn rendered the interiors cooler and insect-free. The continuous inflow of air through this mesh maintains the microclimate achieved inside and allows convective cooling enhanced by the cold air from the still floor.

Salient features of this innovative method of house construction are:

- ◆ The buildings can be erected more quickly with a smaller labour force at the site.
- ◆ Buildings are lighter in weight resulting in savings on materials and foundation.
- ◆ Improved systems of layout of spatial planning, ventilation, plumbing, and waste management help in achieving cost-saving and conserves energy.

- ◆ Every bit of available land is put to use through the development of built form on a still platform with lightweight floor.

- ◆ A holistic built environment of clean and healthy surroundings pleasing to the aesthetic sense and conducive to the local economy is achieved through backyard farming, cattle, poultry, fish rearing, etc.

- ◆ The role of aided self-help is emphasized in the solution of low-cost housing problems.

- ◆ Formwork less casting methods for economy and resource-saving.

Comments from Residents

The house was created for the elderly parents of the architect who commented, "We moved into the house 2 months before the national lock down in 2020. During our retirement life, we found the house engaging us at many levels. During the lockdowns, we were completely engaged with vegetable gardens, fish farming, Pets etc. The special design typology of house has helped us to engage ourselves with all these activities which otherwise would not have been possible on a small site. Also the house has economically benefitted us by not eating up into our retirement savings. The microclimate inside the house has been very welcoming and our guests are always wondering how we were able to manage the cool climate inside the house without having to put mechanical supports. The space has been very engaging for our younger son who stays with us to carry out the activities in his creative field of writing."

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REPORT

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SUMESSH MENON

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Architects Tara E Pandala & Ajay Abey, CSBNE, Kerala

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