

KERALA | SUSTAINABILITY

Couple's Sustainable 'House Of Hope' Is 50% Cheaper & Stays 8 Degrees Cooler

By [Himanshu Nitnaware](#)

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Architects Ajay Abey and Tara Pandala have built a sustainable and eco-friendly home on their ancestral land in Kerala, using methods that are half the cost of conventional methods and kind to the environment

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While many architects emphasise on the use of sustainable construction and design, a couple from Kerala has put this into action with the construction of a home using eco-friendly material. Architects Ajay Abey and Tara Pandala have built a 1,600 sq-ft home for their parents in Rs 27 lakh using sustainable methods. The cost of building this home is almost 50% cheaper than that of building one using conventional methods, the architects say.

Speaking with **The Better India**, Ajay says, "My father did not want to spend a lot of money on building a house for his retirement. The use of conventional methods incurs heavy costs and is harmful to the environment due to the use of unsustainable material."

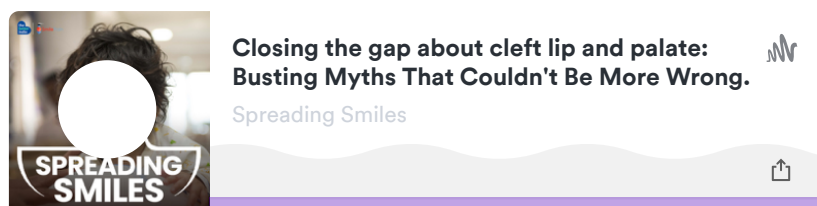
He says, "Climate change and affordable housing are **closely related**, as people require shelter and their fundamental right is non-negotiable. However, the same demand puts pressure on natural resources, and unsustainable practices put stress on the environment."

Ajay adds, "The existing norms in 'Green Certified Housing' are unaffordable and unfeasible at times. We realised that instead of complying with the slated norms, it would serve better to follow a need-based approach using sustainable methods."



Living room

Hence, the duo decided to build a house on their ancestral land in Kakkanad of Kerala.



The unique aspect of the house is that its features can be adopted across all regions of India and withstand multiple weather conditions, Ajay says.

Sustainability all the way

“We decided to adopt a new construction methodology called Energy Efficient-Climatologically. We employed contextually relevant economical, environment-friendly and reused materials,” he says.

He adds that the new method holistically addresses the sustainability and affordability of a single-family housing unit.

Explaining the features of the house, Ajay says that they adopted a unique approach from the beginning stages of its construction.

“The building is raised using **stilt** columns, which involves creating pillars above the

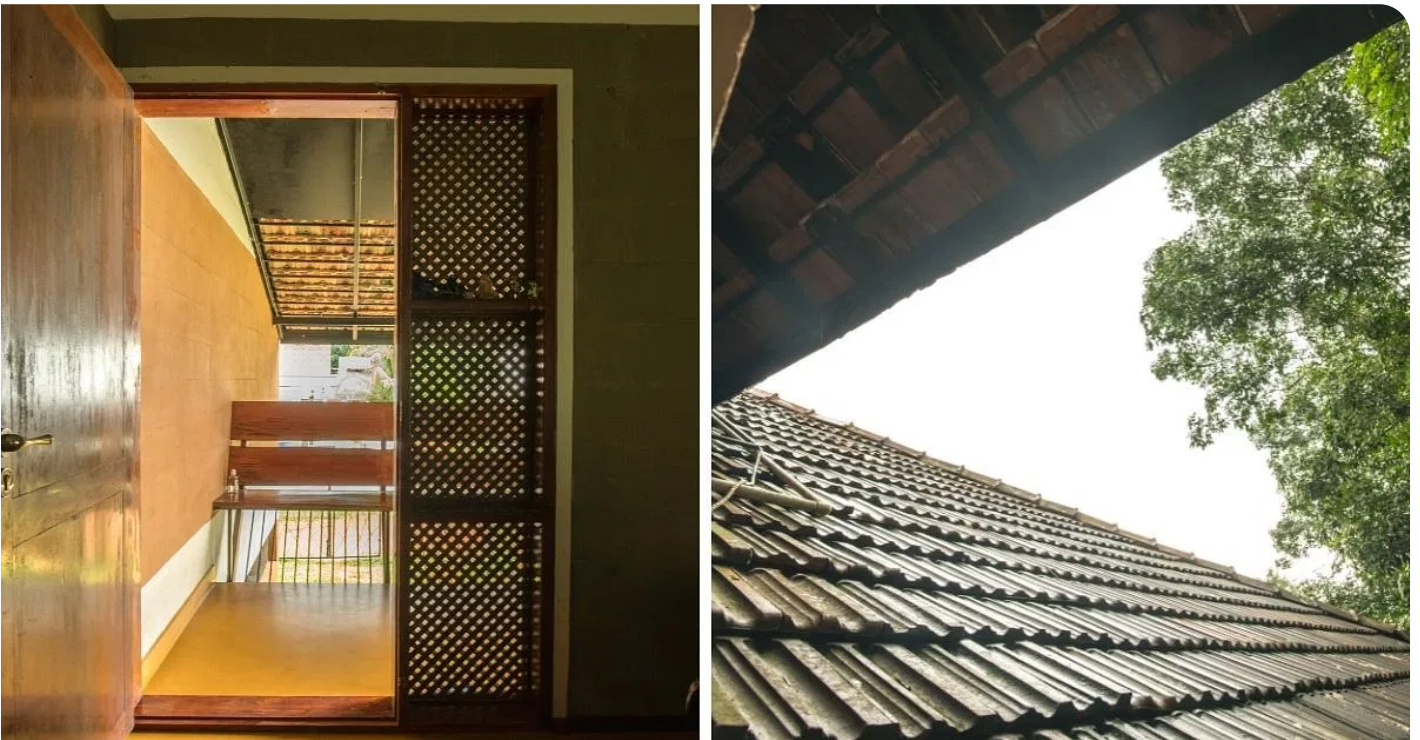
ground of the building. The technique helps prevent damage from rainwater, floods and shifting of land during events such as earthquake,” he says, adding that the comparatively cooler earth in the semi-accessible floor serves as a cold air reservoir to assist conveyed passive cooling,



Ajay says the next innovative feature involves rib and skin shell slab systems. “The system requires only a 1.5-inch concrete bed against the conventional 4 inches and saves 60% of the material in the slab construction. Moreover, it is lightweight and saves significant load on the foundation,” he explains.

“We used the shell slab infill made from non-degradable solid waste such as glass, plastic and others, thus saving resources for construction and reuse of waste materials,” he adds.

The other advantages of the method are that it does not involve formwork, enables using lightweight steel mesh for reinforcement, and lowers the cost. “The work on a 1,000 square-foot space was completed in two days by three men with minimal training,” he says.



Chajja and ventilated roof structure combines to lower the ambient temperature of the house.

Ajay says that they also used aerated concrete blocks made from fly-ash, an industrial by-product. It enabled the reduction of the overall weight of the structure. "These blocks require no water curing and saves thousands of litres of the precious resource. The same material was used in making lintels, which are horizontal blocks that bridge the open space between two vertical supports," he says.

The architects avoided concrete and steel sunshades and instead used metal chajjas for ventilation and light.

Tara says they used multilayer lightweight steel fabrication for the roof structure. "It has a 3-cm air gap between the reused terra-cotta tile and the roof sheets used to prepare the topmost structure. The three layers facilitate convective cooling and ensure the structure remains cooler during hot summer months. The natural mechanism also helps keep the interiors significantly cool compared to a roof made from conventional materials," she says, adding that the lightweight reduces the structural expenses.

Tara says that apart from the structure, a significantly different approach has been used for giving environment-friendly finishes to the house. "The walls have mud wash, making them breathable and free from chemical materials or toxic paint coating. The windows and doors are carved out of the thin wooden sheath. Special care has been taken to use plantation wood considering the replenishable value of wood in construction," she says.

The couple deviated from conventional glass windows and used stainless steel insect-proof mesh for window frames, which contributed to cooler interiors.

“The consistent inflow of air through the mesh maintains microclimate inside the walls and allows convective cooling assisted by the cold air from the stilt floor,” Tara says.

“The overall measures taken during construction consume 67% less concrete, 75% less steel and no rubbles, as compared with conventional house typology of similar scale,” she adds.

House of hope

Architect Ajay Abey Thara Pandala

Stilt pillar foundation doubles up as semi-cooling space and other.

Apart from the structural features, Tara says the innovative methods of construction help reduce the time and cost of labour during the construction process. “The buildings have better spatial planning, ventilation, plumbing and waste management systems that save energy,” she adds.

The mud plaster gives a unique aesthetic sense, healthier environment and is conducive to the local economy. Tara says that the structure and model of the house are flexible and scalable. "The size can be reduced or increased depending on the needs of a person," she adds.

Ajay's father, Abraham Joseph, says that he moved into the house two months before the COVID-19 lockdown in 2020. "The house creates a microclimate which is welcoming and comforting at all times. Many guests often wonder how the house has cooler conditions during summer. The ambient temperature difference is about 8 degree Celsius without any use of coolers or air conditioning, which is significant and often leaves visitors awestruck," he says, adding, "Most importantly, the house has not consumed my entire retirement savings."

To summarise their work in a gist, Ajay says, "I like to call it the House of Hope as it is a planet, people and pocket-friendly home."

Edited by Divya Sethu

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