

Mud house for modern green living

Idea based on harmony with nature, optimising resources, not new technology

Mud used to make sun-dried bricks, other ingredients sourced locally

By Mahashwetha Dass



Revathi Kamath's mud house, surrounded by greenery. The rooftop is covered with grass to keep the house cool

Indian architects Vasanth and Revathi Kamath have built a unique mud house amidst the concrete maze of India's National Capital Region (off Delhi) in Anangpur village, Faridabad.

The emphasis of this structure is on back-to-nature construction techniques, use of locally-available building materials, and being ecologically sensitive.

"There is a need in this country to understand that there is scope for the interaction of architects and architecture with the poor, even in the rural areas, to better understand local ecology and improve the quality of life for people. So, I started designing ecological buildings by which I can

improve the state of the environment," says Revathi.

The Kamaths' two-storey mud house is built on 1.25 acres of a disused quarry that is today lush with vegetation including *neem*, *dhak*, and *babool* trees. Its roof is alive with grass that produces oxygen, absorbs heat and keeps the building cool.

"The bamboconcrete roof uses the intrinsic tensile strength of bamboo with a minimal one and a half inches of cement mortar over it to form a structural slab," says Vasanth, adding that the roof is supported on A-frame tree trunk trusses.

The key uniqueness of the Kamaths' house, however, is in the use of

sun-dried mud bricks instead of clay bricks. "Clay bricks are burnt, using fossil fuel (mainly wood in India), with significant energy consumption and ecological consequences. For our house, we used mud from our land, moulded the bricks on site and sun-dried them."

For wall plaster, the Kamaths used the traditional mud and cow-dung mixture for the first coat, while subsequent finer coats had *chandan* and *haldi* (sandalwood paste and turmeric) mixed into the mud. These natural admixtures have antiseptic and aesthetic qualities.

Keeping cool, naturally

The house's drainage system uses a natural recycling process that purifies the waste and water through an anaerobic chamber. Above the chamber are plants that draw up the water and purify it as well.

During the warm summer months, occupants of the mud house benefit from its natural cooling system. Revathi says: "We have a courtyard and sprays where, with just four large buckets of water, our entire house is cooled in the heat of summer. The temperature in here is about six to seven degrees lower than outside." There are also three ponds in the compound that cool the breeze that ventilates the house.

The mud house does not run on solar power, however, although the Kamaths rely heavily on solar cookers and have fitted solar lights at the entrance of the house.

"We have not used solar panels to generate electricity, even though we would have liked to, because of their prohibitive initial cost. Individually-powered solar lights have been installed in the landscape and are functioning, but solar water heating is yet to be incorporated," says Revathi.

Spreading eco-knowledge

The couple's lifestyle has influenced many of their clients to follow their footsteps, resulting in them being engaged to construct such dwelling places and buildings in different parts of the country, from Nagaland to Jaipur.

One of their latest projects, based on the idea of utilising renewable

energy, is the Gnostic Centre in Palam, Delhi. Here, they used mud-and-rags technique to plaster the internal walls of the conference room, where sound absorption was an issue. The room uses energy-saving LED lights while solar-powered lights are fitted in the compound.

This site, where construction is still ongoing, has been designed with the natural environment in mind. For example, the Kamaths built an earth tunnel system to prevent rain from flooding the compound. Rainwater is recycled to keep the grass on the rooftop green. The building uses a chilled water air-conditioning system that not only keeps the building cool even in summer, but also saves a significant amount of energy. Air for the rooms is cooled by fans blowing it over chilled water coils in devices called fan coil units.

Contextual, local design solutions

Revathi believes architects should work with their clients in a participatory way, and that each person has his set of values that needs to be respected. This is why, despite having the same essential elements, each project looks different. Revathi works with the locals in deciding which designs best suit the particular project site's unique environment.

In building the mud house and Gnostic Centre, the focus has been to minimise even the use of modern green building components such as LED lights, water chillers, solar panels, solar lights and fan coil units. "Our effort has been to build ecologically, with natural materials, many of them from our land and the others from nearby, using labour-intensive techniques, which makes sense in over-populated India where traditional building craft skills are dying out."

When asked about energy bill savings, Vasanth explains: "We have never attempted to compute the savings in our energy bill because of the passive cooling features, so I would not like to hazard a guess, but surely, about 18 tonnes of air-conditioning have been saved by the design, materials and features used, as we have no air-conditioning, and yet have an incredible level of thermal comfort in summer." ☺



• Top: The amphitheatre in the Gnostic Centre in Palam, Delhi. The walls are mud plastered and the hall is sound-proof and lighted with LED lights. Rags have been used in the mud walls to make them sound absorbent
• Above: This pond in the compound of the Kamaths' mud house helps bring down temperatures around their home
• Right: Natural elements are used to decorate the premises
• Bottom: The Kamaths have built an earth tunnel system in the Gnostic Centre to prevent rainwater from flooding the compound. The water can also be recycled to keep the house cool and the grass green on the rooftop



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7 OPPORTUNITIES: Watch out for South Korea

32 CASE STUDIES: Mud house for modern green living

38 PEOPLE: Nobuo Tanaka talks about global energy in the 21st century

46 EDITORIAL: Mammoth opportunities in megacities

48 INFO: Power play in ASEAN cooperation

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