

**Future
Architecture
Platform**



Archifutures

The Site

**A field guide
to the future
of architecture**

Edited by &beyond



A Self- Constructed Paradigm



**Housing that is about
more than just houses**

**By Sara Neves
and Filipe Estrela**

A Self-Constructed Paradigm
Housing that is about more than just houses

By Sara Neves and Filipe Estrela

A Self-Constructed Paradigm

“Gharaunda aims to create conditions to encourage the young to stay in rural areas by choice, with dignity and pride in a rural identity.”

Filipe Estrela and Sara Neves describe how, by working together with villagers in rural Bihar, India, they developed a flexible housing model to improve living conditions, in a project that considers the whole building lifecycle – not just the final built form.

We believe that by taking the rural as a valid alternative to the urban, we let cities breathe and contribute to the emancipation of the urban and its transformation.



Gharaunda is an ongoing housing project for low-income families in rural Bihar, India.

The majority of housing projects are focused on the future of cities and the problems coming from their population growth. But does everyone want to live in cities?

India needs about 20 million urban houses and 45 million rural ones. Bihar is the third most populous state in India where 89 per cent live in rural areas and 30 per cent live on less than one euro per day. 50 per cent of their houses

Sara Neves and Filipe Estrela

Architects Sara Neves and Filipe Estrela are graduates of the Faculty of Architecture of the University of Porto (FAUP). They both worked on a number of projects and for several studios until setting up their own independent practice in 2015. They are moved by the same interest in long-term immersive projects and hands-on fieldwork, in which architecture is not the only object or goal.

Previous page: new flexible housing model developed by Sara Neves and Filipe Estrela in Bihar, India.

This page: new housing model seen beyond a typical traditional house. © Sara Neves and Filipe Estrela

A practical approach

A Self-Constructed Paradigm

are made of raw thatch, bamboo and/or mud, 62 per cent of which have no toilet and 89 per cent of which have no electricity or solar energy.

The young seeking employment in cities suffer difficult living conditions and the pressure on farmland for fast-paced urban growth is leaving behind a trail of destruction in villages, leading to a loss of livelihoods and lack of housing and access to basic services.

45 per cent of Bihar's population are under 20 years old and many of the young would prefer to stay in their villages if they could have access to better living conditions.

So we looked to help reframe these conditions.

The Gharaunda project is focused on rural development through sustainable housing construction. Tailored for the local culture but improving the local standard minimum living requirements, Gharaunda aims to create conditions to encourage the young to stay in rural areas by choice, with dignity and pride in a rural identity.

A new model

In rural Bihar, a *pucca* house, which is a permanent building made with materials resistant to the local weather conditions, is generally the desirable upgrade from the typical *kaccha* house - a building made of basic raw materials that needs to be rebuilt every season. However, even most *pucca* houses of low-income families don't have a water supply, sewage or even a toilet, and are built with very unstable construction methods that lack foundations.

So we set out to design a new model of housing that achieved a balance between tradition and change.

Archifutures

Our prototype design is not for a specific family, but for several families with different sizes and routines – given the number of people living in the same house can range from two to 21 people. So the house is adaptable to differing family dynamics with customisable rooms.



The rooms are designed to be completely flexible allowing a family to use them as they see fit: two bedrooms, or four smaller bedrooms, or one bedroom and one living room, or two smaller bedrooms, a smaller living room and a store room. There are two doors to each room meaning a partition – such as a curtain – can be placed in the middle, so that each room – even if divided in four – can be accessed independently.

A large part of the prototype's structure is dedicated to outdoor spaces. In line with tradition, there are two separate verandahs, one for women – facing the courtyard – and one

The interior spaces of the new housing model balance flexibility and privacy. © Sara Neves and Filipe Estrela





A Self-Constructed Paradigm

for men – open to the public space or street. However, the women’s verandah is also placed adjacent to the street, separated from the men’s verandah by a perforated wall, encouraging communication and reducing the separation between genders.



Previous and this page:
Men's verandah adjacent to the street is here joined to the women's verandah, separated only by a perforated wall. © Sara Neves and Filipe Estrela

For cooking there seems to be a move to adopt more modern methods over traditional ones, such as cooking in earthen stoves outside and eating on the floor. So while the kitchen space is designed as an indoor standing one, we have connected it with the main verandah to preserve the link with tradition.

Despite efforts to end public defecation, the government has found resistance to change, given local prejudice about having a toilet inside the house. While the villagers requested an indoor bathroom, they preferred one that maintained privacy in its use, separated from the rest of the house. The bathroom opens to the back of the house, only accessible from the outside. Although included in the core structure, it is separate from the life of the rest of the house.



Solid and permanent

Gharaunda takes local materials and techniques as the basis to co-develop and disseminate more advanced construction techniques that incorporate foundations, more robust materials and safer working methods. Bamboo is commonly used locally, as a material it is very resistant and can last for several decades, while its flexibility and bending strength make it an ideal seismic-resistant construction material. Bricks, cast with holes through them, are highly advantageous for several reasons: made from the soil-waste on the construction site which has been excavated for the foundations, these bricks mitigate the need to build double walls, being laid on end in a “rat-trap” bond system that provides good thermal insulation, while allowing for infrastructure to run inside the bricks and providing a neat wall finish.



Local materials are used for the construction: bamboo and bricks moulded from the soil-waste of the site. © Sara Neves and Filipe Estrela

A Self-Constructed Paradigm

Infrastructure

The water supply employs a low-cost system, that does not require electricity, providing tap water inside the house. It combines a manual hand-pump, positioned using local techniques, a tank and a network of pipes.

The sewage system employs a local septic system, eco-friendly and affordable. The digested waste can be used as soil-conditioner for agricultural purposes or as biogas fuel.

Electricity meanwhile is provided through a straightforward system that combines all the gadgets onto one simple circuit board, positioning one board in each room.



Spatially the Gharanda housing model invites in light and natural ventilation.
© Sara Neves and Filipe Estrela

Spatially, the form of Gharanda also invites in sunlight, encourages natural ventilation and aims to offer beauty and a pleasing atmosphere - because being proud of and enjoying one's house has to be part of minimum living requirements everywhere.

Gharaunda is a tailor-made housing paradigm designed with the whole lifecycle of a building in mind – from the diagnosis of the need and the design concept, to its construction and the businesses involved, their labour conditions, sales and maintenance – creating new livelihoods for some in the process and aiming to have a long-term impact on villagers’ lives.

From harnessing the local value chain and its natural resources, Gharaunda proposes a sustainable housing model that is almost 100 per cent constructed using local renewable materials, widely available throughout India. This allows a potential role as a wider model for rural development, through its lower budget and ecological balance. Inspired by local techniques, it is modular, designed in order to simplify most construction processes, and to help launch construction businesses at a village level to produce and build locally, independently of globalised and centralised systems of production.

Self-constructed paradigms are a demand for architecture in which processes and form carry equal weight, an awareness that housing is not just about houses. A housing paradigm has to take into account more than just the final product and its end-users: building a house is about jobs and their conditions, the workers involved and their skills, resources and their source and who owns them, about costs and profit, the environment, its protection, and about waste. The form should embody all these processes in its development.

This project is about shared responsibility based on interdisciplinarity; moving beyond just the overlap of specialised domains and based on community immersion and co-creating with the inhabitants. It is about hands-on

The paradigm

Self-constructed paradigms

**“ Being proud of
and enjoying
one’s house has
to be part of
minimum living
requirements
everywhere.”**





A Self-Constructed Paradigm

co-building and giving the users the tools to continuously update in response to changing needs.

We need to generate more housing from usable, safe and beautiful forms and building paradigms in which these values are the right of all. The priorities should be: use value not market value; protection not financial security and harmony not brand trend. ■

Previous page: Housing that prioritises use value not market value; protection not financial security. © Sara Neves and Filipe Estrela