

Blooming House: A Resilient Habitat for Flood-Prone Lagos

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Abstract: The Blooming House is a flexible housing prototype designed to respond to flooding in Lagos, Nigeria. The city faces serious challenges like housing shortages, food insecurity, and displacement caused by seasonal floods. Many low-income communities are at risk. This design offers a low-cost, resilient solution that protects both people and their livelihoods.

We developed the Blooming House as part of an architectural competition. It combines living space, farming, and livestock shelter into one modular system. The structure adapts to changing water levels. In dry seasons, the ground level supports agriculture and animal care. During floods, the raised platform becomes the main living area. This dual-use strategy creates a dynamic and multifunctional home.

The design builds on global examples of flood-resistant and floating buildings. But it adds something new by merging shelter with food and animal safety. We used local materials like bamboo, concrete, and corrugated tin to keep costs low and construction simple. Rainwater harvesting and polyethylene insulation improve climate performance. The Blooming House can be repeated in other flood-prone areas. It goes beyond basic housing. It helps people stay safe, grow food, and protect animals. This kind of design shows how architecture can support fairness and resilience, especially where infrastructure and support are limited.

Keywords: Flood-Resilient Housing; Livelihood Preservation; Climate-Adaptive Architecture; Informal Settlements; Modular Design; Lagos, Nigeria.

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I. INTRODUCTION

Lagos is growing fast, but flooding remains a serious problem. The city has over 20 million people and many informal settlements. Low-income families, especially those who farm or keep livestock, are most at risk. Seasonal floods damage homes, disrupt lives, and threaten food security every year (World Bank, 2020; UN-Habitat, 2021).

Through our team's research and design competition work, we saw that most housing solutions miss the bigger picture. Many focus only on shelter. They often ignore how people depend on farming and animals to survive. Floating homes are creative, but they are costly and hard to build in informal areas (Adelekan, 2010; Boano & Kelling, 2013).

This paper presents the Blooming House. It is a new kind of flood-resilient housing that we designed together. It is more than a place to live. It helps people grow food, protect animals, and stay safe during floods. Our goal was to create something simple, low-cost, and grounded in the everyday needs of vulnerable communities.



Fig 1 Site Context and Flood Vulnerability in Lagos
(Source: Author’s Design Studio)

II. LITERATURE REVIEW

Urban flooding in Lagos has been studied by both global agencies and local researchers. Reports from the World Bank (2020) and UN-Habitat (2021) show that rapid urban growth, poor drainage, and unplanned development have made the city more vulnerable to seasonal floods. Informal settlements are hit hardest. Many homes are self-built and lack strong foundations.

Architects have responded to flooding in different ways across the world. In Lagos, the Makoko Floating School introduced amphibious design suited to local conditions (Adeyemi, 2013). In cities like Jakarta and Dhaka, elevated housing has been tested to protect low-income families from rising water (Revi et al., 2014). These designs are creative, but many remain one-off projects. They are often too complex or costly to scale.

Our team focused on the idea of transformative architecture, a design that adjusts to environmental change and supports daily life. Habraken (2000) explored flexible built environments. Sanyal (2011) looked at how housing can include farming. These ideas helped us think beyond shelter. We wanted to design a system that also supports food, animals, and community resilience.

Even with these examples, we found a gap in the literature. Few housing models combine shelter, farming, and livestock care in one low-cost design. Most focus on just one part—floating homes, farming modules, or animal shelters.

Very few bring all three together. The Blooming House tries to fill that gap. It offers a multifunctional design that responds to both environmental risks and everyday needs.

III. METHODOLOGY

Our research followed a design-led approach. The Blooming House was first developed as part of a speculative design competition. For our team, it became a way to explore how architecture can respond to the everyday challenges of flood-prone communities in Lagos.

We started by studying informal settlements in low-lying areas. Many residents rely on farming and livestock. Reports from the World Bank (2020) and UN-Habitat (2021) helped us understand the scale of flooding, housing shortages, and weak infrastructure. One of our early findings was that livestock shelters often flood first. This leads to income loss and food insecurity. Based on this, we decided to raise the human dwelling and use the ground level for farming and animal shelter.

Our design process was visual and hands-on. We used diagrams, sketches, plans, and renderings to test ideas. These tools helped us shape a structure that works in both dry and wet seasons. In dry months, the ground level supports agriculture and livestock. During floods, the raised platform becomes the main living space. Blooming verandas extend from the house. They allow vertical farming, help with cooling, and offer space to dry crops and store tools.

We chose materials that are affordable, available, and familiar. Bamboo was used for the frame because it is strong, renewable, and widely known in informal construction (Jain & Kumar, 2016). Concrete was added for durability. Corrugated tin roofing kept costs low. We also used polyethylene insulation to improve comfort and protect against moisture. A rainwater harvesting system was built into the roof to collect water during both seasons.

Our design focused on the users. We kept the construction simple and modular. The structure can be scaled and adapted to different flood levels. We assumed that local communities would help build and maintain the house. This shaped our choices in layout, materials, and function. We wanted the design to feel practical, flexible, and empowering, something that supports both survival and dignity.

In short, our method combined real-world observation with speculative design. It gave us a framework to create

housing that is resilient, adaptable, and rooted in the needs of those most affected by flooding.

➤ *Concept*

The Blooming House is a flexible shelter designed to respond to seasonal flooding in Lagos. Unlike typical housing, it changes with the environment. During floods, the structure adapts to protect both people and animals. This idea came from a design competition focused on climate-resilient architecture. The challenge was to create a low-cost, multifunctional home for vulnerable communities.

Our design brings together three key needs: living space, farming, and livestock shelter. These elements are combined into one modular system. We believe that housing in flood-prone areas must do more than provide shelter. It should also help people protect their food and animals. By including farming and animal safety in the design, Blooming House offers a complete solution to displacement and food insecurity.

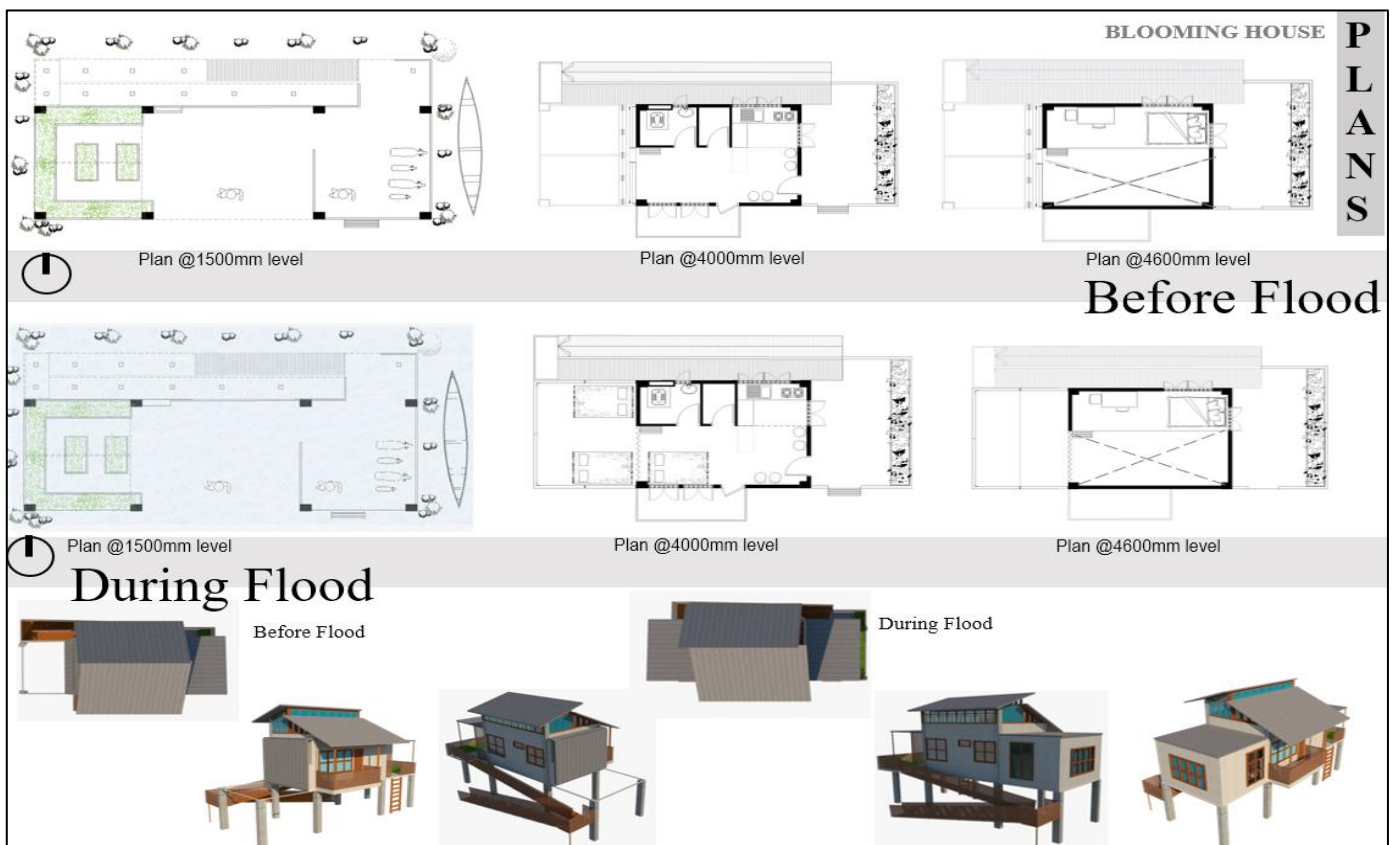


Fig 2 Conceptual Evolution of the Blooming House
(Source: Author’s Design Studio)

➤ *Spatial Strategy*

The Blooming House is designed to work in both dry and flood seasons. It follows a dual-condition layout that changes with water levels. In dry months, the ground level is used for farming and livestock shelter. This space is open and easy to access. It encourages community use and supports daily agricultural work.

When floods arrive, the upper platform becomes the main living area. It is small but efficient. It keeps people safe above the water line while staying connected to the surroundings. Verandas extend from the house and serve many roles. They support vertical farming, help cool the space, and act as buffer zones. These areas also give extra room for drying crops and storing tools. Together, they improve both the environmental and social value of the house.

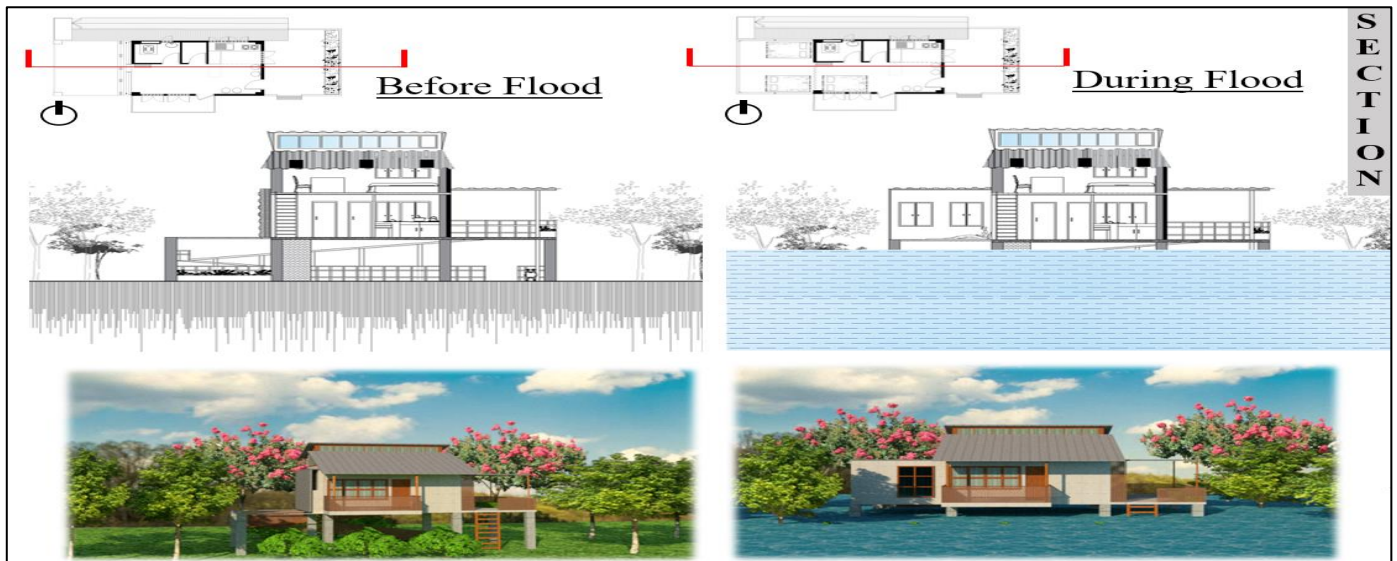


Fig 3 Spatial Strategy: Dry Season vs. Flood Season Configuration
(Source: Author’s Design Studio)

➤ *Materiality*

We selected materials based on cost, availability, and sustainability. Bamboo was used for the frame. It grows fast, is strong, and can be easily sourced. It is also familiar to many local builders (Jain & Kumar, 2016).

Concrete was chosen for the outer walls. It is durable and can resist water damage. For the roof, we used corrugated tin. It is light, cheap, and easy to install.

To improve comfort, we added polyethylene insulation. It helps control the temperature and protects against moisture. We also designed a rainwater harvesting system. It collects water from the roof and stores it for reuse in both dry and wet seasons.

These materials were not only practical. They were also familiar to the communities we designed for. This made the construction process easier and more accessible.

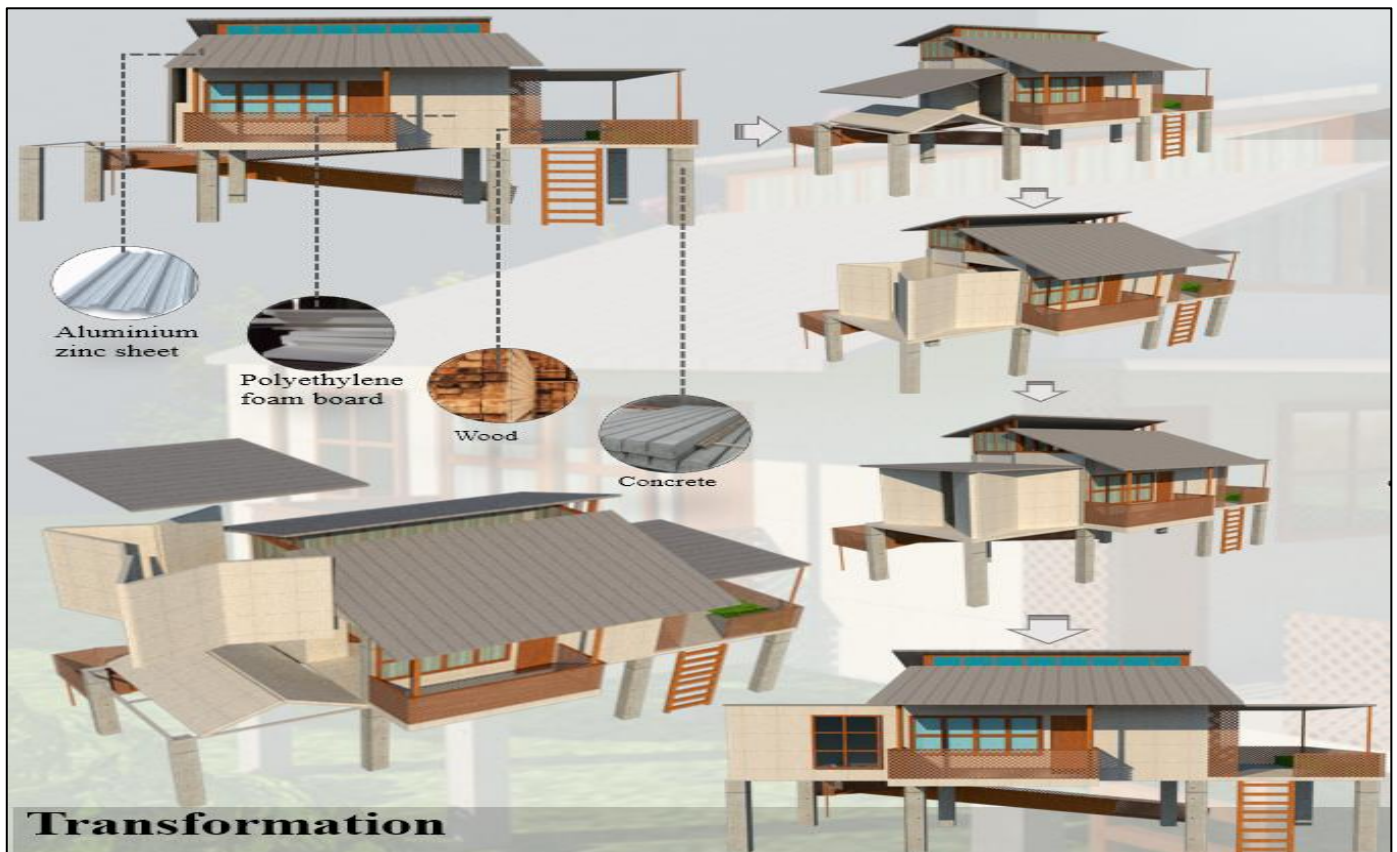


Fig 4 Material Palette and Construction Layers
(Source: Author’s Design Studio)

➤ **Functionality**

The Blooming House is designed to support daily needs during both dry and flood seasons. It combines shelter, farming, and animal care in one system. The ground level helps with food security. It allows space for growing vegetables and keeping animals like goats and cattle.

When floods come, the raised platform becomes the main living area. It includes space for cooking, sleeping, and sanitation. This keeps people safe above the water.

Verandas extend from the house and serve many roles. They support small-scale farming, even during floods. They also offer space to dry crops, store tools, and gather with others. These features turn the house into more than just a shelter. It becomes a place that protects life, food, and community.

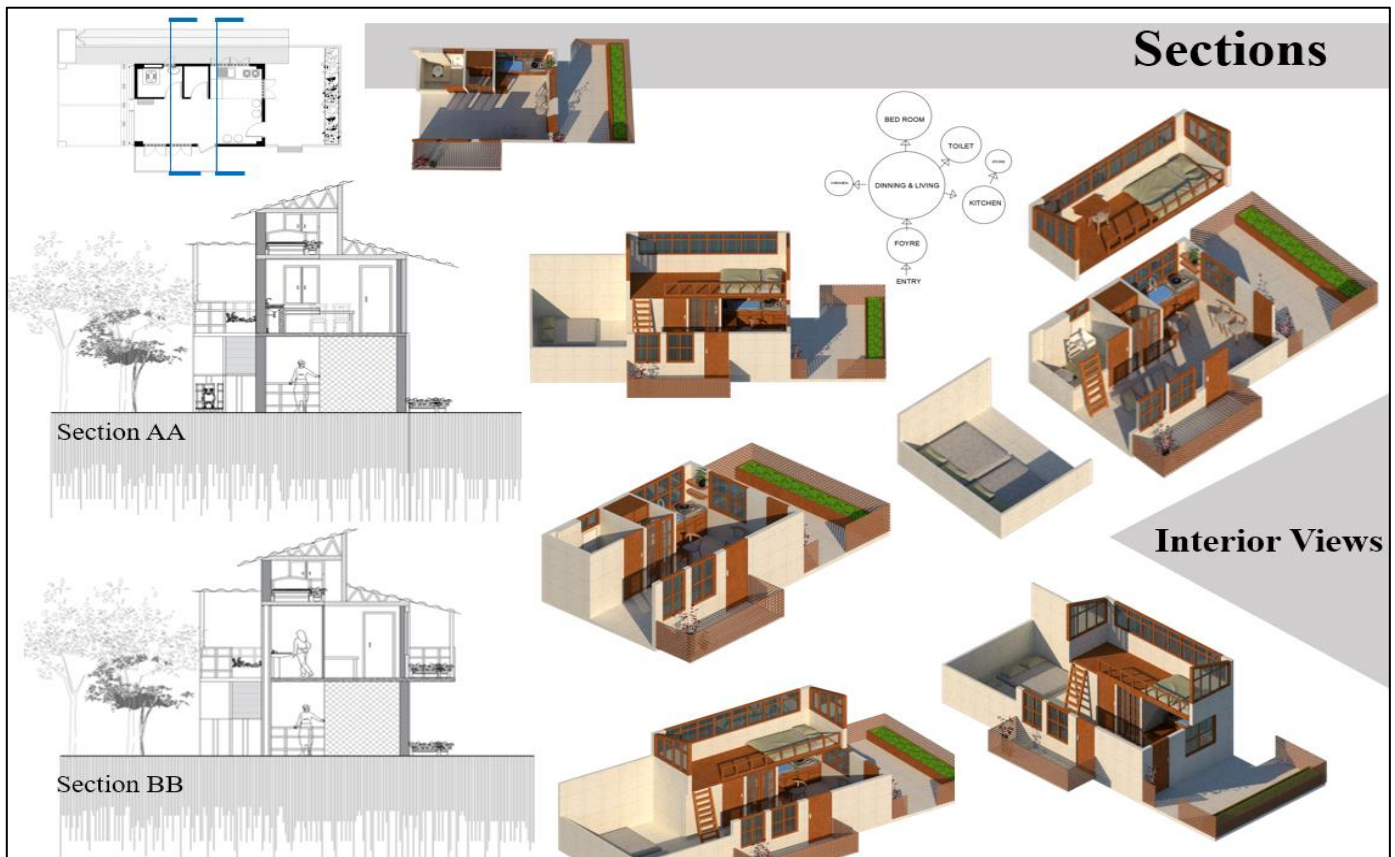


Fig 5 Perspective View of Blooming House in Flood Condition
(Source: Author’s Design Studio)

IV. DISCUSSION

The Blooming House offers a practical alternative to typical flood-resilient housing in Lagos. It does more than provide shelter. It also protects food systems and livestock, which are often ignored in emergency housing (World Bank, 2020; UN-Habitat, 2021).

By combining farming, animal safety, and living space, the design supports full livelihood resilience. This is especially important for low-income families who depend on agriculture and livestock.

Earlier designs, like floating vessels or boathouses, explored water-based solutions. But they are hard to build and maintain. The Makoko Floating School introduced amphibious design in Lagos (Adeyemi, 2013). However, it faced limits in cost and scale. The Blooming House takes a different path. It stays on land and uses simple, familiar

materials. This makes it easier for communities to build and adapt.

The design also follows global trends in climate-adaptive housing. Cities like Dhaka, Manila, and Jakarta face similar flood risks (Revi et al., 2014). The Blooming House can be adjusted to fit local needs. Its focus on food production also supports urban farming, which is growing in disaster-prone areas (Sanyal, 2011).

Still, there are challenges. The structure needs more testing to confirm its strength during long floods. Some communities may be unsure about living above ground or sharing space with animals. Training and support will be needed to help people build and use the design.

Even with these limits, the Blooming House shows promise. It offers a model that can be repeated and scaled. It puts survival and dignity at the center of housing design.



Fig 6 Perspective View Showing Integration of Shelter, Agriculture, and Livestock
(Source: Author's Design Studio)

V. CONCLUSION

The Blooming House shows how architecture can do more than provide shelter. It can help protect food, animals, and livelihoods in flood-prone cities like Lagos. By combining living space, farming, and livestock care, the design responds to real problems—displacement, food insecurity, and climate stress.

This project adds to the conversation on transformative architecture. It offers a low-cost, community-based solution that is both practical and forward-looking. It also opens space for future research. We believe speculative design can guide real-world action, especially in cities facing climate change and fast urban growth. The Blooming House is a step toward more resilient futures—where housing helps people not just survive, but thrive.

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