**The Rising Horizon**

 **Concept Narrative**

Discuss materials, design concept, visitor and community experience, co-benefits, shared land uses, and any other Our concept was inspired by the experience of arriving at Naviti Island. Since the island can only be accessed by boat or air, visitors first encounter it gradually from the sea—as the land slowly emerges from the waves. The ocean is a defining element in the lives of the locals: many rely on fishing, and even those who don’t spend their days in close proximity to the salty water.

However, due to the effects of climate change, this once familiar and life-giving sea has also become a growing threat. Rising sea levels are contaminating freshwater supplies and making the natural environment increasingly unpredictable. This duality—the ocean as both a source of life and a looming danger—and the search for solutions to the growing issue of water scarcity form the foundation of our concept.

Our design evokes the motion of the waves surrounding the island while responding to the urgent need for fresh water. We have created an aesthetic and functional element in the landscape that is not only symbolically linked to water but also provides a new opportunity for rainwater collection to benefit the local community.

In designing the structure, it was important for us to create a building with a strong visual identity while maintaining a connection to traditional local architecture. The structure was inspired by the traditional *bure*-type houses widely used in Fiji—thus, we employed simple, easy-to-construct techniques and prioritized the use of locally available, natural materials. Although the building's proportions and scale are significantly larger than traditional local dwellings, its form and materials ensure that it blends harmoniously with its surroundings.

Functionally, the building serves multiple purposes. Its primary role is to host a photovoltaic system that supplies energy for the village, but it is also capable of accommodating a variety of communal and social activities. The large, overhanging roofs provide shade and protect against rain when needed, making the building an ideal community space for the residents.

Thanks to movable and openable wall structures, the building is flexibly adaptable: it can be fully opened toward the sea to serve as a lookout or panoramic resting area, or closed off to create a more sheltered and intimate environment. Considering the village’s tourism goals, the structure can also fulfill multiple guest-related functions—it can serve as a market for local producers, a venue for workshops, or even temporary bivouac accommodation with the addition of internal partitions.

1. **Technical Narrative**

The project includes the installation of a solar panel system positioned on north-facing rooftops with a 20° tilt angle. This configuration is optimized for solar energy capture, given the island’s proximity to the equator, where sunlight typically strikes from a steep northern angle throughout most of the year. All roof surfaces are fully utilized; no space remains unexploited.

The structure consists of ten rectangular modules that can be expanded as needed. Each module rests on four vertical coconut wood columns, with additional stability and anchorage provided by wooden trusses. The walls are composed of bracing elements made from coconut wood and panels made of bamboo, which also serve as decorative features—altogether utilizing local, renewable materials. The foundation was built using a screw pile system, meeting the structural requirements without the need for concrete.

The roof structure consists of a simple wooden frame covered with corrugated metal sheets, chosen for their ability to securely hold the solar panels while ensuring structural strength. In total, we installed 20 roof panel modules, two per module unit.

Two enclosed spaces within the building house the system’s electrical components (inverter, transformer), the rainwater storage tank, the filtration system, and a water block for basic hygiene use.

 **Energy Production**

A total of 160 photovoltaic panels have been installed on the roof, each covering an area of 2.53 m². With an arrangement of 8 panels per module, the total photovoltaic surface reaches 404.8 m². The system is capable of producing more than 75 kW of clean energy annually, with potential surplus capacity to supplement nearby communities. Electricity is distributed via underground cabling to local consumption points.

**Rainwater Collection**

The building’s rainwater harvesting system channels rainfall from the roof surfaces via a gravity-fed gutter network into a closed water storage tank integrated into the complex. Water is treated through filtration and disinfection equipment, ensuring safe usage for agricultural, domestic, and hygiene purposes.

**System Inputs:**

sunlight
rainwater
user community

**System Outputs:**

electricity for lighting, cooling, and device charging

harvested water for agricultural and domestic use

multifunctional community space for locals and tourists

A primary consideration throughout the project was to minimize environmental impact while using locally sourced, natural building materials and techniques. This approach not only enhances sustainability but also reduces the need for long-distance transport, further lowering the structure’s ecological footprint.

1. **Prototyping and Pilot Implementation Statement**

The structure consists of ten modular units that are both structurally and functionally interconnected. To test the concept, a prototype can be realized by constructing a single module—or even just half of one. Even this partial implementation would allow for testing of the construction system, assessing the behavior of the materials and techniques, and evaluating adaptability to local conditions.

The local community plays a crucial role in the realization of the project. Construction processes are based on straightforward, local technologies that can be quickly learned by local workers. During the prototyping phase, local residents and craftsmen will be involved in the preparation, building, testing, and long-term maintenance processes. At the same time, this phase provides an opportunity to collect community feedback, which can be incorporated into the final building configuration.

The test module serves not only as a technical prototype but also as a platform for experimenting with various functions. The testing phase allows users to try out different space divisions, surface finishes, and spatial configurations, selecting the most suitable options for their needs.

1. **Operations and Maintenance Statement**

One of the cornerstones of sustainable operation is the active involvement of the local community. The long-term success of the project depends on how strongly residents feel ownership over the structure and their willingness to maintain and develop it. Accordingly, the maintenance system is designed to be simple, user-friendly, and community-focused.

The timber components are treated with natural, locally produced preservatives that protect against high humidity and insect damage. Since the structure uses largely traditional construction techniques, maintenance and minor repairs can be carried out easily by local craftsmen.

Thanks to the elevation of the building above ground level, most of the structural elements are protected from the harmful effects of runoff rainwater and moisture evaporating from the soil.

The metal roof and solar panels require regular cleaning and inspection. These tasks can be handled by trained local work groups, ensuring the system remains operational. The rainwater tank’s accessible design facilitates easy cleaning and water level monitoring, supporting hygienic and safe water use.

The photovoltaic panels are modularly installed, allowing for quick and cost-effective replacement of any worn components. The design of the roof and panel placement accounts for local environmental phenomena, such as the so-called “coconut rain.” Modern solar panels are factory-tested for impact resistance and are not susceptible to damage from such natural events.

A long-term maintenance fund could support system upkeep, financed through visitor fees, or revenue from the use of the harvested water and generated electricity. This fund would cover minor repairs and upgrades, contributing to the durability and reliable functioning of the infrastructure.

1. **Environmental Impact Assessment**

The building is designed to integrate into the existing ecosystem with minimal disruption. Its modular design allows the structure to adapt to the terrain with limited earthworks, avoiding major environmental disturbances. The foundation—constructed using screw piles—requires no concrete, significantly reducing its environmental burden. Most components can be constructed on-site using hand tools, and prefabricated parts are compact and easy to transport by boat. As a result, the project’s overall energy demand during construction is very low.

Material selection emphasizes locally available, natural resources—such as bamboo, coconut palm, and other plant-based materials—which are biodegradable, easily recyclable, and do not unduly burden the island’s ecosystem. The metal trapezoidal sheets supporting the solar panels are also recyclable should the structure ever be dismantled. The roof’s sloped design allows for efficient rainwater collection, helping to alleviate stress on the freshwater supply, which is increasingly threatened by rising sea levels.

The openable wall panels provide natural ventilation, enabling passive cooling and eliminating the need for mechanical air-conditioning. Despite this, a comfortable interior climate can still be maintained. The building’s footprint is minimal: every square meter of roof area is used for solar energy production, ensuring we take no more from nature than necessary. Existing vegetation is preserved wherever possible, or restored after construction.

The project’s goal is not only to reduce environmental impact but also to strengthen the local community’s relationship with nature. For this reason, the building is designed to reflect respect for the natural environment and to promote its sustainable use.