**Concept Narrative**

Photovoltaic and Water Collection Tower

A Lightweight, High-Impact Infrastructure for Marou Village

Inspired by local traditions of weaving and seafaring, our Photovoltaic and Water Collection Towers evoke the plaited baskets and sailing vessels native to the region. The exterior surface draws on traditional patterns of palm or pandanus-leaf basketry, with photovoltaic panels arrayed in a distinctive plaited geometry—suggesting a basket afloat, reaching skyward. Within, an inverted net captures rainfall, echoing the structure and symbolism of fishing tools and woven traps.

The supporting structure is a hybrid tensegrity system: primarily tensile, with selectively rigid components. This system is both materially efficient and highly resilient—capable of withstanding extreme winds by flexing rather than resisting. Drawing on principles from sail rigging, the design uses steel and UV-resistant nylon cables, avoiding the need for heavy machinery or highly specialized labor during construction.

The towers are conceived as beacons—visible from both Marou Village and the surrounding sea. Their shimmering forms, emerging from the treetops or behind village dwellings, are meant to spark curiosity and guide travelers. Among the four proposed towers, three are dedicated to water collection, while the fourth incorporates a climbing structure for children, weaving functionality with play.

**Technical Narrative**

Power Generation & Storage

Each tower supports 40 standard 500W commercial PV panels (dimensions: 2000mm × 990mm), each capable of generating 2–3 kWh per day. In total:

Per Tower: ~80 kWh/day

Annual Output (4 towers): ~136,000 kWh

Storage: Standard LFP (lithium iron phosphate) batteries

All electrical control systems are housed in elevated, secure containers at each tower base, easily accessible for monitoring and maintenance.

Water Collection System

The interior net is designed to guide rainwater into a durable, UV-resistant nylon basin. Each of the three water-collection towers stores up to 63,000 liters, totaling 189,000 liters site-wide. Seasonal rainfall will, of course, influence actual storage levels.

**Prototyping and Pilot Implementation**

We plan to make two site visits.

Visit One:

Survey the site and confirm the tower locations

Meet with community to develop a collaborative plan

Begin preliminary site preparation (if possible)

Following this visit we will begin to coordinate fabrication and material delivery.

Visit Two:

Project Construction

**Operations and Maintenance**

To reduce cost and simplify logistics, the design incorporates readily available components:

No custom-fabricated parts.

PV frames serve as semi-rigid elements in the tensegrity system

Construction requires no heavy equipment.

Assembly can be performed with common tools and with assistance from the Marou Villagers.

Maintenance is minimal: PV panels can be cleaned annually with a power washer or high-pressure hose. Replacement of cables, fasteners, or fabric components can be done using standard fittings.

**Environmental Impact Assessment**

Each tower occupies a minimal footprint, providing partial shade without obstructing plant growth or animal movement. The open, porous geometry ensures light and rainfall reach the ground, preserving ecological viability below. During construction, any surface disturbance is temporary, and post-installation impact is negligible.