SOLAR LANDSCAPE

MAROU-FIDJI-17.1167°S,177.267°E.

The proposal for LAGI 2025 in Marou embodies a fundamentally different approach from the often superficial "eco-solutions" typically imposed on fragile contexts. **Instead of replicating prefab green models, we aim to generate an endogenous proposition** - one that emerges from the territory itself, rooted in its resources, topography, and rhythms. This project doesn't simply generate electricity or purify water: **it reshapes the landscape while enhancing its ecological identity**.

A LIVING LABORATORY: MERGING NATURE, TECHNOLOGY, AND EDUCATION

The site transcends its role as an energy plant and water treatment facility to become a **living laboratory where nature and technology converge**. The open galleries and cenotes form a self-sustaining micro-ecosystem, offering a playground for visitors to explore. **This project delivers an immersive ecotourism experience**, inviting guests into a unique environment while providing a **strong educational and playful dimension for children, future generations, and the local inhabitants of Marou**. By integrating the village into the daily life of the site, it also becomes a space of creativity, **learning, and sharing around sustainable energy and water management**, fostering community engagement and growth.

WATER BEGINS THE STORY: CAPTURE AND STORAGE

The system starts with the **collection of rainwater flowing down from the surrounding mountains**. A discrete network of drains channels the runoff into a series of subterranean reservoirs. This invisible but essential infrastructure **guarantees a stable water supply for multiple uses**: powering the energy system, irrigating filtration wetlands, and ultimately delivering potable water to the community.

A GEO-ENERGETIC SYSTEM

At the heart of the project lies a 45-meter-wide solar parabola, 20 meters deep, **concentrating sunlight onto a thermal cell** located 19 meters above ground. **Static and adaptive mirrors focus solar energy to heat water**, which then drives a **hydrothermal turbine, producing electricity**.

- Solar capture surface: 839 m²
- Effective solar input: ≈ 353 kW
- Daily energy output: ≈ 1,355 kWh
- Water needed: 26 m³/day, heated from 25°C to 95°C
- Battery storage: 1,500 kWh lithium LFP, ensuring 30 days autonomy in poor weather

This system is built on a simple but powerful principle: **harnessing solar and thermal energy to produce electricity, while using water as an energy carrier**. Architecture here becomes the interface for a symbiotic exchange between natural forces and human needs.

MATERIAL CONTRAST, CONTROLLED IMPACT

The project's materiality is defined by subtle contrasts: **most of the system is buried, carved into the local rock, limiting land use and visual impact**. Only 5% emerges - delicately - above the surface, revealing a set of finely tuned structures. Visible elements - **buildings, towers, walkways** - lay with texture and reflection:

- **Brushed or polished metal**, catching and reflecting light, naturally weathering over time.
- **Raw concrete**, cast in place, echoing the local geology.
- **Meshes**, grilles, and corrugated panels, made from simple, local, or recycled materials.

This blend balances spatial invisibility with bold emergence - an architecture that asserts itself without overwhelming the surrounding landscape.

ARCHITECTURE AND CLIMATE: A MICROCOSM OF LIFE

The main roofs rise in a stepped rhythm, **channeling airflow and softening wind exposure**. Taller structures are topped with openwork roofs that allow breezes to pass through, supported by a lightweight tubular frame reinforced with cables, **combining transparency with structural strength**. **Excavated soil is reused on site** as low mounds, increasing reservoir capacity while offering natural wind protection.

This arrangement frames the site's three key buildings:

- **Welcome & Exhibition**, a public space to explore the project;
- **Storage & Control**, the technical core for energy and water systems;
- **The Turbines**, where heat transforms water into electricity.

CLOSED-LOOP WATER MANAGEMENT

Water purification is handled by three **wetland basins, using carefully selected local plants** with proven filtering capacities and ecological benefits:

- **Vetiveria zizanioides** (vetiver): reinforces soils, purifies water, and aids land regeneration.
- **Scirpus spp.** (rushes): oxygenates water and maintains clarity.
- **Colocasia esculenta** (taro): a native plant that restores ecological balance.

These wetlands provide a **natural and effective filtration cycle, integrating seamlessly into the site's ecological rhythms.**

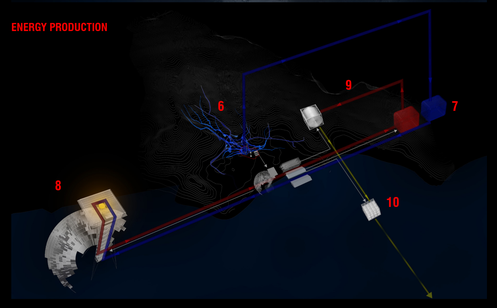
SOLAR LANDSCAPE: AN OPEN HORIZON FOR MAROU

Solar Landscape is designed to evolve with the village. As local energy and water needs shift, each module - technical, architectural, ecological - can be expanded or reconfigured to reflect the priorities, resources, and vision of the people of Marou. **A system that listens, adapts, and endures.**

IRRIGATION

SOLAR RADIATION

ENERGY PRODUCTION



1 - RAINFALL
Rainwater falls on the surrounding highlands.

2 - RUNOFF
The water flows naturally down the slopes.

3 - COLLECTION
It is captured by an underground network of galleries and stored in reservoirs.

4 - SOLAR IRRADIATION
The sun's rays strike the reflective parabola.

5 - CONCENTRATION & COLLECTION
Mirrors focus the energy onto the thermal cell to heat the water.

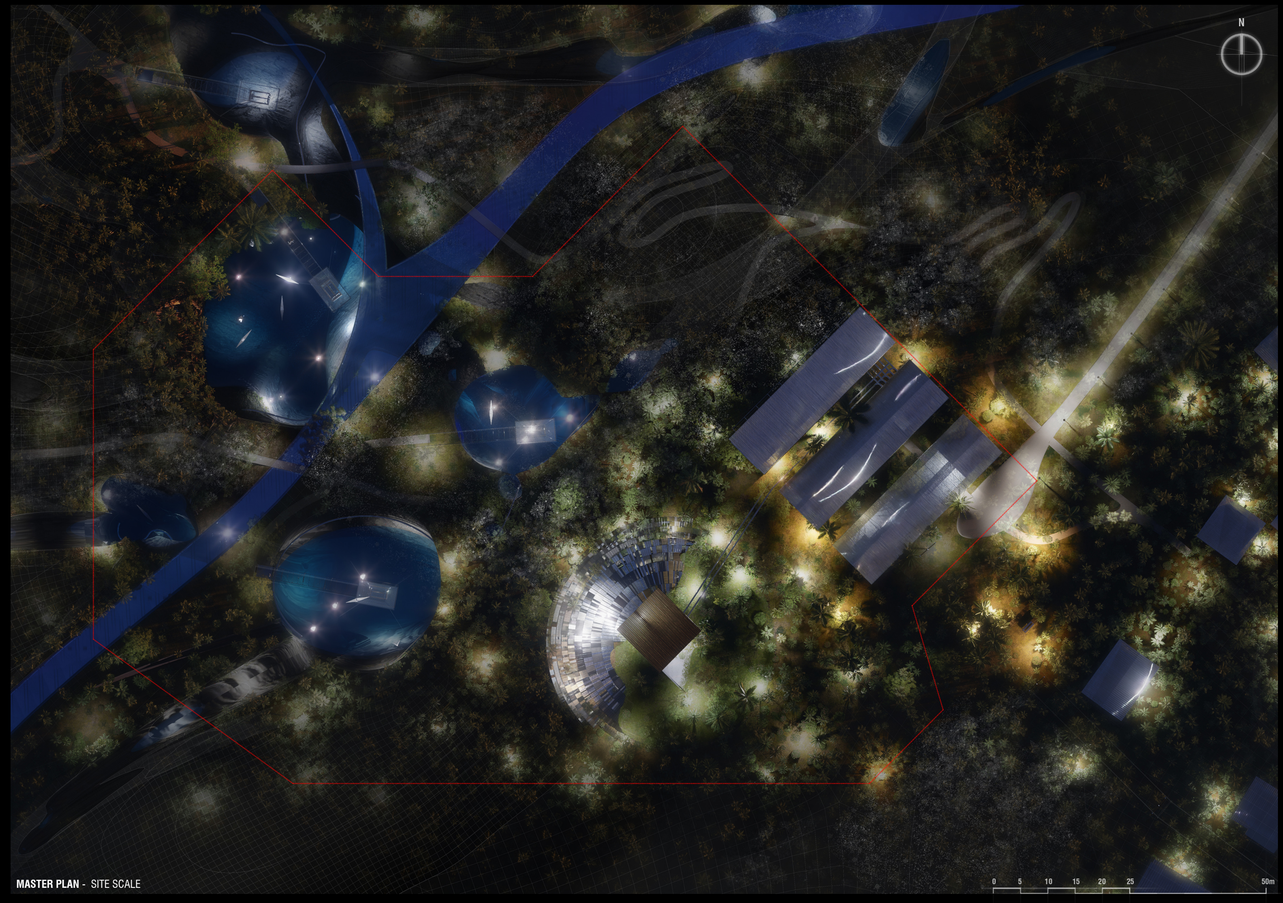
6 - PUMPING
Water is drawn from underground reservoirs into the cold-water tank.

7 - COLD STORAGE
The tank holds the water before it's sent to the solar tower.

8 - SOLAR HEATING
Water is pumped into the tower's thermal cell, where mirrors focus sunlight to heat it.

9 - STEAM GENERATION
The heated water descends through turbines, vaporizes, and powers generators.

10 - STORAGE & SUPPLY
Generated electricity is stored in batteries and supplied on demand to the village, with ample reserve capacity.



MASTER PLAN - SITE SCALE