**Conceptual Narrative**

This design proposes a regenerative land art installation for Marou Village, Fiji, conceived within the LAGI 2025 framework. It addresses the critical need for reliable clean energy and water in remote island communities by integrating functional infrastructure within a compelling, site-specific artwork. The vision transcends utilitarian solutions, aiming to create a landmark that embodies the interconnectedness of the community, their environment, and vital resources. It serves as a testament to sustainable living, blending aesthetic engagement with essential service provision (75kW+ solar power and water harvesting) for the 67 households and Yasawa School.

The artistic concept draws inspiration from Fiji's rich natural environment, cultural motifs, and traditional practices, seeking originality and deep contextual relevance. The form will integrate seamlessly with the landscape and the village's primarily single-story architecture, creating a human-scaled yet distinctive presence on the designated energy site. Materials are chosen for both function and aesthetic contribution; options like sleek monocrystalline silicon PV modules or versatile Building-Integrated Photovoltaics (BIPV) allow the energy-generating surfaces to become integral parts of the artistic expression. Water collection pathways and storage may incorporate reflective or cascading elements, celebrating this vital resource. Secondary materials prioritize sustainability and local relevance, exploring options like sustainably sourced timber, bamboo, or local stone, chosen for low embodied energy and durability in the tropical marine climate.

The visitor experience is designed to be inviting and educational, showcasing sustainable solutions in an engaging manner and contributing to a regenerative tourism model that benefits the community. For residents, the installation delivers tangible improvements in daily life through reliable power and water, fostering health, safety, economic opportunities, and overall well-being. Crucially, the design process emphasizes co-creation (post-competition) to ensure the final work resonates with the community, embedding local values and fostering pride and ownership. Safety, particularly for children and animals, is paramount, with sensitive components secured.

Beyond core functions, the installation integrates multiple co-benefits and shared land uses. Potential inclusions are agrivoltaics, shaded areas for respite, community agriculture or aquaculture plots, recreational spaces, educational elements about sustainability, solar-powered food storage, community gathering or performance areas, play spaces, and areas for quiet reflection. These elements transform the site into a multi-functional community asset, enhancing social cohesion and local livelihoods, demonstrating a holistic approach to sustainable development.

**Technical Narrative**

This design incorporates proven and resilient technologies suited for Marou Village's remote island context and climate. The primary energy source is a solar photovoltaic (PV) mini-grid with a capacity of 75 kW or greater. We recommend high-efficiency monocrystalline silicon modules (typically 20-25% efficiency, 30-40 year lifespan) for their proven reliability, longevity, performance in tropical conditions, and sleek aesthetics. Building-Integrated Photovoltaics (BIPV) are also strongly considered for their potential for seamless aesthetic integration and enhanced resilience to high winds. These options are preferred over polycrystalline (lower efficiency, less suited to high heat) or thin-film panels (lower efficiency, shorter lifespan) for the core system, ensuring long-term energy yield and minimizing the array footprint.

Energy storage is essential for providing power during non-sunny periods. Lithium iron phosphate (LFP) batteries are noted as a safe, cost-effective option, but creative, durable alternatives are welcomed. The system will be designed considering the village's energy demand curve and the sun's path in the Southern Hemisphere. While the core system relies on PV, supplementary energy from other renewables like wind, micro-hydro, or tidal power could be incorporated if proven resilient to cyclones and saltwater; experimental technologies are discouraged for primary power due to complexity and lack of field proofing at scale.

Water harvesting is a crucial secondary component, primarily through rainwater collection shed from the PV module surfaces. Storage solutions are encouraged, ranging from concealed reservoirs or ponds to durable tanks (e.g., polyethylene or corrosion-resistant stainless steel for water quality). Optional enhancements could include water treatment (distillation, nature-based systems) or alternative sourcing like atmospheric water generation (hydropanels) or desalination, though their energy demand and maintenance requirements need careful evaluation against the site context.

Structural materials prioritize durability, resilience (cyclones, saltwater), low embodied energy, and transportability. Options include sustainably sourced timber, bamboo, or low-carbon steel with high recycled content for framing. The estimated cost for the core 75 kW PV array targets approximately $15 USD per installed Watt, acknowledging higher logistics costs.

System inputs are primarily sunlight and rainwater, potentially augmented by atmospheric moisture or ocean water if advanced water generation is used. System outputs are reliable electricity (distributed via FREF infrastructure to households and the school) and potable water for village use. Secondary outputs could include thermal heat (if PVT modules are used) or food (if agrivoltaics are integrated). The exact annual energy and water generation figures depend on the final detailed design, module efficiency, orientation, local climate data, shading, and water collection efficiency.

**Prototyping and Pilot Implementation Statement**

Our team envisions a phased, collaborative approach to prototyping and full-scale pilot implementation, ensuring deep involvement from the Marou Village community throughout.

**Stage 2: Prototyping:** Following selection, the $100,000 USD award will fund this stage. An initial $25,000 disbursement supports detailed design refinement and the development of a comprehensive prototyping plan. This plan includes a budget, identification of required consultants (e.g., licensed structural engineer), quantity survey, and execution strategy. Subsequent funding is tied to achieving milestones. The prototype itself will be a functional demonstration of key design aspects, focusing on verifying functionality, resilience (structural, material), construction methods, and O&M procedures. It serves as a tangible communication tool for Fijian authorities (DoE, FREF), partners, and the public. The prototype need not be full-scale (75kW) but could represent a modular unit or critical structural/technological elements. Design priorities include ease of assembly, dismantling, transport (potentially using temporary foundations), reflecting the logistical constraints of the remote location. LAGI and partners will provide access to consultants and local knowledge. Prototyping completion is targeted for late 2025 or early 2026.

**Stage 3: Pilot Implementation:** If the prototype is selected for full implementation, this stage involves translating the winning concept into a detailed, construction-ready design. This requires close coordination with LAGI, Marou Village residents, FREF (for electrical distribution integration), DoE, and other local authorities to secure permits and finalize plans. The budget for the full-scale project will be determined based on the finalized design details.

**Community Collaboration:** This is fundamental to both stages. We will engage Marou Village residents actively through workshops, participatory design sessions, and regular consultations. Their input is vital for ensuring cultural appropriateness, contextual fit, and meeting specific community needs and aspirations. Local labour will be prioritized during construction phases, coupled with capacity building and knowledge transfer initiatives. This ensures residents gain skills relevant for the installation's long-term operation and maintenance, fostering a strong sense of ownership and pride. The community’s prior involvement in co-creating the design brief and their participation in the review and jury process sets a precedent for this continued deep collaboration.

**Operations and Maintenance Statement**

This installation is conceived for a lifespan of 30+ years, with local maintainability and community stewardship as core principles. Recognizing Marou Village’s remote location, the design emphasizes durability and requires consistent "human love and attention" for its long-term care, fostering community ownership.

Operational tasks will include routine monitoring of energy generation and water storage levels, basic cleaning of solar modules (as needed based on local conditions), and visual checks of system components. The Fiji Rural Electrification Fund (FREF) is establishing a tariff structure for metered household electricity use, intended to generate revenue covering ongoing operational costs. For water systems, operations involve monitoring levels and managing distribution as designed.

Maintenance activities will encompass periodic inspections, preventative measures (e.g., cleaning gutters/filters for water harvesting), and necessary repairs. The design prioritizes proven, durable technologies like monocrystalline silicon PV or BIPV and robust water storage options (e.g., stainless steel tanks) to minimize complex maintenance requirements. Structural elements and materials will be selected for resilience against high winds, cyclones, and saltwater corrosion, reducing the frequency of major interventions. Any proposed technologies beyond the core PV and water systems will be rigorously evaluated for their long-term maintenance demands, especially regarding moving parts or complex electronics exposed to the marine environment.

The local community's contribution is vital. A comprehensive capacity building and knowledge transfer program, implemented during the prototyping and pilot phases, will train designated local residents. This training covers system operation, routine maintenance procedures (cleaning, basic checks), troubleshooting common minor issues, and safety protocols. The objective is to equip the community with the skills and knowledge for largely independent day-to-day management over the system's life. Creating a cherished community space further motivates active care and upkeep. Long-term waste management from operational activities (e.g., component replacement) will also be considered in the O&M plan. Major maintenance requiring specialized skills or equipment beyond local capacity will be coordinated with FREF or external technical support, although the design aims to minimize this dependency.

**Environmental Impact Assessment**

This assessment briefly outlines potential environmental effects of the installation and mitigation strategies. The designated site is a clearing currently used for farming and recreation, situated between Marou Village and the mountains, near stormwater channels and an estuary, on relatively shallow-graded terrain. Some tree removal within the boundary is permissible if required for the installation.

**Potential Negative Impacts & Mitigation (Installation):**

* **Site Disturbance/Erosion:** Construction activities will cause temporary disturbance. Given the proximity to stormwater channels and potential flooding, erosion control measures (e.g., silt fences, phased clearing) are crucial. Best management practices will minimize soil disturbance.
* **Construction Waste:** Local waste management (landfill, burning) is challenging. Mitigation involves designing for minimal waste (e.g., material efficiency, potential prefabrication) and aiming for the "zero waste" aspiration outlined in the brief through careful planning and material selection. Sustainable construction workshops with the community can enhance adoption.
* **Habitat Disturbance:** Limited tree removal may impact local fauna; careful site planning will minimize this.

**Potential Negative Impacts & Mitigation (Operation):**

* **Physical Footprint:** The installation will alter the landscape aesthetically and physically. Mitigation involves sensitive design integration, using forms and materials harmonious with the surroundings.
* **Hydrology:** The installation's surfaces and foundations could alter local drainage patterns. Given the site's potential for flooding and proximity to channels/estuary, the design must incorporate flood resilience and ensure it does not exacerbate existing drainage issues, possibly integrating water management features.
* **Materials End-of-Life:** Long-term disposal of components (PV modules, batteries, etc.) needs consideration. Mitigation involves selecting durable materials with high recyclability potential and adhering to circular economy principles.

**Positive Environmental Effects:**

* **Clean Energy:** The primary benefit is displacing potential fossil fuel use with clean solar energy, reducing greenhouse gas emissions.
* **Water Resource Management:** Rainwater harvesting reduces reliance on potentially vulnerable groundwater sources or unprotected wells, potentially protecting freshwater aquifers from overuse or saltwater intrusion.
* **Ecosystem Integration/Enhancement:** The design can incorporate positive ecological features. Agrivoltaics can support soil health and local food production. Nature-based water treatment systems (if used) can create wetland habitats. The structure could potentially incorporate shelters for native species or support local biodiversity.
* **Reduced Embodied Energy:** Prioritizing sustainable, local, and low-embodied energy materials minimizes the project's upfront environmental footprint.
* **Education & Awareness:** The installation serves as an educational tool, promoting environmental awareness and sustainable practices within the community and among visitors.