**LAGI 2025 Fiji Narrative Template**

1. **Concept Narrative**

Our project addresses a fundamental, universal need: the generation of renewable energy. By installing 400 m² of photovoltaic panels, we aim to fulfill this need through a humble yet bold intervention—a raised solar roof that merges clean energy production with public spatial generosity.

Positioned at the southern edge of the site, the roof is angled at 16° toward the north to optimize solar gain. This singular gesture—a homogenous pitched surface—embodies simplicity in both form and purpose. The structure is not meant to stand out through architectural complexity but to serve as a functional landmark, contributing to the energy infrastructure while also enriching the social fabric of the community.

To ensure the installation contributes beyond energy production, we designed the solar roof to be elevated, allowing for a large shaded space below. By lifting the panels above human scale, we created a versatile covered area that invites community use. We have intentionally not defined the function of this space—it is left open, adaptable, and responsive to local needs. It may become a meeting point, a market, a performance area, or a quiet retreat.

To further enhance the spatial experience, we introduced strategically placed voids within the solar array. These openings allow sunlight to pierce through, creating patterns of light and shadow that shift throughout the day, animating the space and encouraging people to linger and interact.

The structure is made of locally sourced Fijian bamboo, stacked and tied in traditional ways to form columns and beams. This approach supports local craftsmanship, reduces transportation emissions, and connects the installation with vernacular building practices. Above the bamboo frame, we installed the photovoltaic system, but enclosed it in a layer of woven bamboo cladding, both to hide technical components and to celebrate traditional Fijian artistry. The bamboo cladding also presents the opportunity to incorporate a rainwater harvesting system into the design, turning the roof into a multi-functional environmental tool.

This concept is as much about the people who will gather under it as it is about the power it produces. The space is not complete without community ownership and interaction. By creating an open-ended, inhabitable canopy, we hope to deliver a structure that provides energy, fosters culture, and becomes a part of everyday life. In doing so, we treat renewable energy not just as infrastructure, but as civic architecture, seamlessly woven into the rhythms of local living.

1. **Technical Narrative**

The Solar Canopy integrates a set of appropriate, efficient, and locally maintainable technologies designed to deliver maximum benefit with minimal complexity. The primary goal is to generate electricity via 400 m² of photovoltaic solar panels, and our design ensures optimal performance and durability through a careful integration of structural and environmental systems.

Technology Overview:

Photovoltaic Panels: Fixed-tilt panels oriented 16° north to capture maximum solar exposure across seasons.

Rainwater Harvesting: Woven bamboo roof cladding doubles as a catchment surface, with internal channels directing water to ground-level storage tanks.

Concealed Cabling: All wiring and technical elements are hidden within the cladding, preserving visual and cultural integrity while maintaining safety.

Optional Additions: System-ready for small-scale battery storage or inverter integration for nighttime or off-grid use.

Estimated Annual Outputs:

Electricity: 60,000 to 70,000 kWh/year, depending on solar intensity, panel efficiency, and minor seasonal variations.

This output is sufficient to power local lighting, charging stations, small appliances, or be fed into a microgrid.

Water: Rainfall collection could yield between 25,000–30,000 liters annually, depending on precipitation patterns.

System Inputs and Outputs:

Inputs: Sunlight, rainfall, and minimal maintenance labor.

Outputs: Renewable electricity, stored water, shaded social space, and environmental data for education.

Technology Selection Rationale:

We prioritized systems that are durable, low-tech in maintenance, and easily understood by non-specialists. The solar panels require little intervention post-installation, and the water system has no moving parts, reducing the risk of mechanical failure. Local materials and construction methods reduce costs and carbon footprint while enabling local ownership of repairs and adaptations.

The structure also offers potential for educational engagement through environmental sensors (e.g., solar output monitors or rainwater gauges), which can be displayed via digital or analog meters. This transforms the canopy into a living classroom, emphasizing visibility and transparency in sustainable systems.

This integrated approach allows the structure to operate as more than just a power plant. It becomes a hybrid utility and civic space—providing shelter, cultural expression, energy, and water. Each system works in tandem with others and within the local climate to generate a model that is both resilient and replicable.

The result is a technology ecosystem that not only serves a functional purpose but also builds capacity within the community. It’s a simple, intentional combination of tools that empowers people to take part in the renewable future without reliance on external systems or expertise.

1. **Prototyping and Pilot Implementation Statement**

Our team’s approach to prototyping and implementation is rooted in collaboration, local partnership, and iterative design. We recognize that successful built interventions are co-created—not just constructed—and that their relevance depends on community involvement from the earliest stages.

**Phase 1: Prototyping**

We will begin with a scaled module, approximately 10 m², that includes a structural bay of the bamboo framework, one solar panel, and a woven cladding test section. This prototype will allow us to:

Test structural stability of bamboo under local wind and climate conditions

Refine the tying techniques and verify long-term durability

Evaluate sun and shade performance under the elevated roof

Experiment with wiring concealment and cladding attachment methods

This phase will also serve as an opportunity to engage community members, particularly local builders, weavers, and youth. We will host workshops and demonstrations on sustainable building methods and solar technology basics, ensuring that the knowledge around the project is distributed and retained locally.

**Phase 2: Pilot Implementation**

Once the prototype is refined, we will move toward the full-scale pilot construction. Community collaboration will remain central:

Local Labor: Bamboo harvesting, preparation, and weaving will be done in partnership with local craftspeople and volunteers.

Community Consultation: Prior to construction, we will hold participatory design meetings to gather input on the location of the structure and any contextual concerns.

Training and Knowledge Transfer: A core group of community members will be trained to assemble and maintain the structure and its systems.

In this phase, flexibility is key. The construction timeline will allow for adaptive modifications based on real-time feedback and evolving community needs.

Sustainability of Implementation

We will ensure that documentation and construction guides are left with the community so they can replicate or adapt the design in the future. The simplicity of the roof’s geometry and the standardization of its bays make this easy to scale or reconfigure based on available land or funding.

Ultimately, the success of the pilot is not just about energy output—it’s about community authorship. We aim to deliver a project that is not dropped in from above but grown from within, using local hands and minds to shape something meaningful, useful, and sustainable.

1. **Operations and Maintenance Statement**

A key design principle of the Solar Canopy is that **simplicity equals longevity**. Every component—from the bamboo structure to the photovoltaic system—has been chosen to minimize maintenance complexity while maximizing community ownership.

**Solar Panel System Maintenance**

The solar panels themselves require limited intervention. Their angle prevents debris accumulation, and periodic rainfall assists in natural cleaning. A **bi-annual inspection** is recommended to:

Check for dirt buildup or damage

Ensure connections remain weatherproof

Monitor output through a simple energy meter

A local technician, trained during the pilot phase, will oversee these checks. Training will include:

Basic electrical safety

System troubleshooting

Panel cleaning procedures

Should repairs be needed, parts such as connectors or inverters can be sourced locally or replaced via remote supplier networks with minimal technical oversight.

**Bamboo and Cladding Upkeep**

The bamboo frame, if treated and maintained correctly, can last many years. We will apply a **natural, non-toxic preservative treatment** during construction to extend longevity and reduce pests. Over time:

Weaving sections may require patching or replacement

Joint bindings may need tightening or reinforcement

Local artisans—already involved in the construction—can handle these tasks with available tools and materials. By using traditional methods, we ensure ongoing relevance and access to repair skills.

**Water Harvesting and Drainage**

If a rainwater system is installed, gutters and storage tanks will need regular inspection. Cleaning leaves or sediment from catchment surfaces and verifying filter functionality should occur quarterly. Community stewards or youth groups could rotate this responsibility.

**Community Stewardship Model**

The open space beneath the canopy does not impose a use, but its operation will benefit from informal caretaking. We propose a **rotating stewardship model**, perhaps led by an existing village committee or school. Responsibilities would include:

Trash collection and general cleaning

Monitoring condition of the space

Coordinating repair needs

This model empowers locals to make the structure their own, while ensuring it remains functional and clean.

We also envision a **community feedback loop**, using gatherings or informal forums to collect suggestions or concerns over time.

Ultimately, we designed the Solar Canopy to be a **low-maintenance, high-value asset**—technically manageable and socially resilient. With minimal effort and shared care, it can thrive for years, delivering power, pride, and place to those who use it.

1. **Environmental Impact Assessment**

The Solar Canopy project was designed with a **light ecological footprint**, embracing local materials, passive design strategies, and renewable technologies to ensure environmental harmony and resilience.

**Positive Impacts**

Reduced Emissions: The system generates an estimated 60,000–70,000 kWh/year, reducing reliance on diesel or grid electricity, and cutting carbon emissions by ~40–50 metric tons annually.

Sustainable Materials: Bamboo is one of the most sustainable construction materials, regenerating rapidly and sequestering carbon throughout its growth cycle.

Local Biodiversity: By elevating the roof and not enclosing the space, we preserve site permeability, airflow, and habitat conditions for plants and small fauna.

**Potential Risks and Mitigation**

Soil Disruption:

Minimal concrete will be used; instead, we plan to anchor the bamboo with light footings that disturb the ground as little as possible.

Native ground cover will be preserved or replanted after construction.

Waste Generation:

We will minimize packaging, reuse offcuts, and recycle all construction debris.

End-of-life planning includes pathways for solar panel recycling and bamboo composting.

Weather Vulnerability:

Bamboo will be treated to resist moisture and UV degradation.

Drainage systems and open joints reduce pooling and waterlogging risks.

Visual and Cultural Fit:

Woven cladding reflects traditional aesthetics and reduces the “foreignness” of the solar infrastructure.

Community involvement ensures the structure feels rooted, not imposed.

Long-Term Ecological Strategy

We view the Solar Canopy as a regenerative infrastructure—one that not only avoids harm but actively contributes to its environment:

Harvests clean energy and water

Celebrates local building knowledge

Creates shaded microclimates for plants and people

By combining renewable energy production with ecological sensitivity and cultural respect, this project sets a replicable precedent for climate-adaptive community infrastructure.