**LAGI 2025 Fiji Narrative Template**

1. **Concept Narrative**

**Poly-Provocation.** Reimagining ocean-bound plastics as an inexpensive and abundant building product with an emphasis on pairing with vernacular bamboo building. This scalable art, references the goals of the National Sustainable Tourism Framework 2024-2034, focusing on supporting local livelihood with the creation of clean energy, potable water, increasing health and repair of reefs, and new economic opportunities in harmony with local ecosystems. Collecting and utilizing ocean-bound plastic reduces waste, promotes the health of rare wildlife, provides tourism opportunities, and promotes new opportunities for the community to create. Traditional bamboo craft provides the framework with an abundant, renewable resource. Redundancies within the complementing clean energy and water systems generate an attitude of resiliency.

1. **Technical Narrative**

Our primary technical goals target providing clean power and potable water that is scalable from Naviti to the rest of Fiji, and other Pacific islands. Solar is abundant for this site, and many other Pacific islands, and due to solar irradiance estimated at 1607kWh/kWp year (according to the provided solar map), our team chose to move forward utilizing two solar energy strategies in two phases. The first phase begins with a PV solar cell panel array onto the pavilion installation. This begins electrical production at a low startup cost. The second phase focuses on using the art installation at a smaller scale to populate a series of solar ponds, paired with an Organic Rankine Cycle (ORC) generator, for long-term generation and electrical storage. The solar ponds were chosen to utilize local resources, high salinity potential for efficiency, increased capacity, and limit the amount of material imported to supporting materials and the ORC generator. The goal of completing both phases is electrical generation and storage between the systems.

Potable water has been considered at both the community and individual scales. Rainwater catchment storage is provided by the pavilion for times of drought, community socializing, and to provide fresh water to the solar ponds. To further community resiliency, an Electrodialysis Cation-Exchange Membrane (CEM) has been specified to desalinate ocean water and provide redundancy to the community, while utilizing the renewable energy created. At an individual scale, individual households can catch and store rainwater by scaling the bamboo & plastic blown installation used to create the solar ponds.

1. **Prototyping and Pilot Implementation Statement**

An exchange of knowledge and a mutual desire to learn between the design team and community is necessary to pair traditional bamboo craft with upcycling ocean-bound plastics. Collaboration with locals knowledgeable in bamboo craft could display, teach other community members, and prototype several iterations of bamboo structure to ‘encapsulate plastic’. To conceive goals with utilizing plastic, shredding techniques, testing granulate/non-granulate, melting, and extruding would have to begin, before testing limitations of scale of blow-molding the plastic. Solar ponds have to be calibrated for efficiency with desired salinity and fresh water at these smaller scales. Lastly, the liner of the solar ponds needs to be looked at further and tested to better understand heat dispensation.

1. **Operations and Maintenance Statement**

Most materials are locally sourced, renewable, and abundant apart from the Electrodialysis machine, ORC generator & PV panels. Electrodialysis Cation-Exchange Membrane (CEM) was specifically specified for its ability to be maintained on-site by backwashing, de-scaling, and use of concentrated salt solutions performed on-site.

1. **Environmental Impact Assessment**

Many of the anticipated environmental impacts are positive and in line with the National Sustainable Tourism Framework 2024-2034. These include rebuilding habitats, protecting wildlife, creating new habitats, and a positive reduction of plastic waste. One speculation that needs more prototyping is what type of liner options exist for the solar pond to ensure the potential heat inside the installation does not negatively impact the surrounding marine life.