**LAGI 2025 Fiji Narrative Template
*The use of this document is optional. It is intended to help you organize your written description that describes your proposal. You do not need to provide answers to each specific question. They are there to help guide you.***

***Do not include any information within the written description file that could identify you or your team members. Please organize your narrative document as per the five sections below. Limit each of the five sections to around 500 words (for a total of no more than 2,500 words in the entire document):***

1. **Concept Narrative**
* This design proposes a new cultural amusement park located adjacent to a village and school facilities, within a scenic tourist area that offers stunning natural views. The core concept integrates solar energy and rainwater harvesting to create a sustainable space that enhances public community, education, tourism, and cultural resources, all experienced through a nature-inspired pathway layout. Flower-shaped PV panels, reconfigured from traditional solar cells, double as sunshades that generate energy and collect rainwater. These sunshades are arranged along a picturesque, nature-evoking trail, allowing visitors to engage in diverse cultural experiences and recreational activities, as well as observe biodiversity in reed beds and farming activities within the surrounding outdoor spaces. The park serves as a shared space for residents, students, and tourists, delivering co-benefits such as energy and water conservation, educational programs, and community event venues. Its pedestrian-friendly, accessible design ensures that people of all ages can enjoy the harmonious blend of nature and technology.
1. **Technical Narrative**
* This cultural amusement park design integrates monocrystalline silicon PV panels and rainwater harvesting systems to create a sustainable, community-oriented space. The PV cell is the currently widely used ‘monocrystalline silicon PV cell,’ utilized with its efficiency in mind, maintaining the square shape without deformation but arranged to fit a petal-shaped frame. Each petal contains five 182mm×182mm cells, and each sunshade module has 16 petals. The entire park site has a total of 169 modules. In other words, the total cell area is 447.84 m², and with an efficiency of 21%, calculated using an average insolation of 5.0 kWh/m²/day and an approximately 80.4% performance ratio, the total annual energy production is about 138 MWh. The flower-shaped PV panels include a feature allowing them to fold in two stages via an internal electric motor to prevent damage from typhoons or strong winds or heavy rains. Additionally, LED lighting is embedded on the side surface of each petal module, serving as illumination for the park at night. Each module also includes a rainwater collector, producing a total of 226,181 liters of potable water annually. Specifically, each of the 169 modules is equipped with a 1.5 m diameter, 0.75 m deep inverted cone-shaped rainwater collector, with a 100 mm diameter water pipe at the collector’s base. This pipe channels water through an in-module purification system, converting it into potable water, which is then distributed via a 400 mm diameter pipe to 12 water tanks. This secures approximately 226,181 liters of potable water annually, stored across 12 stainless steel water tanks. Chosen for their high efficiency and aesthetic integration, these technologies use sunlight and rainwater as inputs to produce electricity and potable water as outputs, powering park facilities, supporting community needs, and educating visitors on sustainability through a nature-inspired, accessible trail layout.
1. **Prototyping and Pilot Implementation Statement**
* The prototyping and pilot implementation for the cultural amusement park center on flower-shaped sunshade modules integrating monocrystalline silicon PV panels and rainwater harvesting systems, completed within 5 months. Prototyping involves building a single module to test energy (138 MWh annually for 169 modules) and potable water (226,181 liters) performance, maintaining the original design as intended, and is finalized within 2 months. The pilot phase deploys 10–20 modules in a park section for 3 months to assess scalability and reliability, using IoT sensors for monitoring and training local residents in installation and maintenance. The community collaborates through an advisory group during prototyping to align cultural elements and participates in the pilot phase via school programs, job creation, and cultural events, ensuring the park reflects sustainability and community needs.
1. **Operations and Maintenance Statement**
* The cultural amusement park will be operated and maintained through a structured plan involving a dedicated operations team to oversee daily functions, monitor performance with automated systems, and follow a detailed manual for safety and troubleshooting, while regular maintenance schedules and a reserve fund ensure longevity and address unexpected repairs. The local community will play a crucial role by participating in training programs to assist with basic maintenance and operations, forming a committee to provide input and organize community-led initiatives, and benefiting from job opportunities in roles like cleaning and security, fostering ownership and ensuring the park remains a sustainable, valued asset for years to come.
1. **Environmental Impact Assessment**
* The cultural amusement park, designed for sustainability, aims to minimize negative effects on natural ecosystems in its scenic tourist area. Potential impacts include minor disruptions to flora and fauna during the construction of pathways and 169 PV panel sunshades, soil erosion from foot traffic, and altered water flow from the rainwater harvesting system (226,181 liters annually). However, its solar energy production (138 MWh annually) reduces fossil fuel use and greenhouse gas emissions, while harvested rainwater lowers municipal water demand. Additionally, the park features an innovative public restroom system with a biogas and composting facility installed beneath the restroom floors. Human waste is processed within this underground system to extract biogas, which can be used as a renewable energy source, while the remaining by-products are converted into nutrient-rich compost to support the park’s agricultural areas, enhancing waste efficiency and sustainability. To mitigate issues, environmental surveys will protect sensitive habitats, native plants will be used for landscaping, erosion control measures like permeable paving will manage runoff, and overflow systems will balance water flow for aquatic ecosystems. Regular wildlife and water quality monitoring will address unforeseen impacts, while the biogas and composting system beneath the restrooms contributes to resource efficiency and reduces environmental impact. Finally, community education programs will foster stewardship to ensure long-term ecological harmony alongside cultural and communal benefits.