**Meke Nexus Project Narrative**

**1. Concept Narrative**

Meke Nexus draws inspiration from the Fijian meke dance, embodying its fluid movements in the design of solar and rainwater harvesting structures. Meke is an important cultural practice that centers on celebration, welcome, community, and storytelling. In taking inspiration from meke, the site encourages a sense of community and a celebration of tradition, all while embodying the energetic and welcoming spirit of the dance. The site thus functions as a nexus of culture, nature, and technology, creating a space of connection and vitality.

The solar and rainwater harvesting structures on the site are designed to maximize their productive capacity while simultaneously expressing the movement of meke dancers. The forms of the structures were designed by capturing and abstracting meke dance movements through long-exposure images of dancers, thus translating the fluid gestures of meke into dynamic spatial forms that appear to dance in the landscape. Like the energy of meke, these structures express a lively and welcoming quality while generating electricity and harvesting water for the community. They are stand-alone structures, allowing them to be placed around the village and at the local school, if desired by the community.

Meke Nexus uses low cost and readily available materials. Local timber is used in addition to fiberglass-reinforced plastic to construct the solar and rainwater structures. Local gravel is used for the paving, with some concrete used in the construction of a central lookout tower that functions as a community gathering space and a landmark that is visible from the shore. The plant materials are locally sourced, culturally significant, and productive. Plants used for timber, fiber, medicine, and food will be planted for communal use, as well as well as for materials for repairing the wood structures. For example, Pacific kauri and yaka will be planted for timber, and pandanus will be planted for making iri, a fan often used in meke.

We envision the local community using the site in several ways. They can use the site to access traditional plant materials for food, medicine, timber, and fiber, as well as collecting treated drinking water. They can also use the lookout tower to assess the landscape as well as monitor the solar panels from above. There is also opportunity for children to play in the site, for example on the various locally-sourced rocks and grass spaces. The community will also have access to space for farming food crops such as taro and cassava within the site. We envision the community gathering space beneath the lookout tower being used in many ways, including a learning space, play space, celebration space, and a space to teach visitors about the culture and traditions of Marou.

Visitors will be drawn to the site’s striking sculptures that punctuate a park-like setting and to the lookout tower, visible from afar, that offers captivating views. The structural forms that express the energy of meke while producing solar energy and collecting water will offer the opportunity to discuss traditional practices as well as local knowledge and climate innovation. This tourist draw will help to create economic opportunities in Marou.

**2. Technical Narrative**

This installation uses Cadmium Telluride (CdTe) thin-film solar panels. We chose this technology to generate solar energy because CdTe solar panels are readily available and have a relatively low cost and low carbon footprint. These solar panels are flexible and therefore are appropriate for use on the curvilinear sculptural forms. They are also ideal in cyclone-prone areas such as Marou because, given that there is no glass to break, they can better withstand high winds and flying debris.

The input to the solar system is 1,000 watts of solar power per square meter at midday. CdTe solar panels are approximately 16% efficient. Each square meter of solar panel surface therefore generates 160 watts of power at peak capacity. The installation has 560 m2 of solar panels within the energy design site boundary, and therefore an 89.6 kW solar photovoltaic nameplate capacity. The annual energy output of the installation, assuming an 18% capacity factory, is 141,281 kWh per year.

To treat rainwater, the installation uses biosand water filtration because it is easy to use, the materials are readily available, and it is low cost to install and maintain. The installation has the capacity to store a total of 63 m3 of rainwater at any given time across its eight rainwater storage structures that also function as solar structures. The amount of water stored in a year depends on how much rain falls in a given year as well as how much water is used.

To give a sense of how much water is collected by the installation, consider a rainfall event in which 20mm falls on the 160 m2 of solar surface area feeding into the rain collection systems in a 24 hour period. In this rainfall event alone, 3.2 m3 of rainwater is captured. If 2000mm falls in a year, which is typical of the western portions of Viti Levu, then a total of 320 m3 could be captured depending on how much stored water is used and thus removed from the storage tanks in between rainfall events.

The solar and rainwater structures use relatively few materials. We estimate that each rainwater storage structure will require approximately 97 1 inch by 4 inches by 8 feet boards for the 44 slats and an extra 98 boards for the seating. The water tank is fiberglass-reinforced plastic, which is an inexpensive and readily accessible material. 270 square feet of wood veneer will cover the underside of the fiberglass-reinforced plastic roof that supports the solar panels. The solar structure has only 18 slats, requiring approximately 27 boards. A structural support pole and the roof supporting the solar panels are made of fiberglass-reinforced plastic, with 270 square feet of wood veneer covering the underside of the roof.

**3. Prototyping and Pilot Implementation Statement**

Before constructing a prototype, we will consult with the community on the installation design to determine if changes need to be made based on local knowledge of the site as well as the needs of the villagers. We will then consult with the community on readily available materials as well as local craftspeople to tailor the design to the practices, skills, and knowledge of the locals.

We will then build one solar/rainwater structure and test its real-world performance, including the performance of the materials, water collection, and energy output, relative to its cost. Based on what we learn, we will then build several more structures in collaboration with local craftspeople.

The selection of culturally important plants will also be a collaborative effort. We will consult with the community to determine which plants should be incorporated into the design. We will then consult further to determine how much land should be devoted to culturally important trees and shrubs, and how much should be set aside for farming. The planting process would ideally be a collaborative effort with the locals to help create a sense of ownership over the space, which will help to encourage long-term tending of the site and the plants.

**4. Operations and Maintenance Statement**

The incorporation of the community into building the structures will ensure that there is local knowledge of their maintenance requirements. The trees planted on the site also ensure a low barrier to the maintenance of the site because they can be used as hyper-local timber for future repairs.

The biosand water filtration system must be maintained by periodically replacing the sand. The solar/rainwater structures are built with slats that are removable to allow for easy access the filtration system for this purpose. We will work with the community to designate a person or group responsible for its maintenance. We will suggest that a portion of proceeds from tourist visits to the site be devoted to a maintenance fund for the water filtration system, including a stipend for those tasked with maintaining the system. We suggest that the solar panel maintenance be funded by the Fiji Rural Electrification Fund, and that the local governing parties be responsible for monitoring the panels and organizing any necessary repairs.

**5. Environmental Impact Assessment**

Meke Nexus will have a positive effect on the local ecosystem because this installation involves reintroducing a significant number of rare and culturally significant native plants. This will help to increase biodiversity and improve habitat for local fauna. It will also help to offset carbon emissions from the construction process and reduce erosion on the site.

The structures on the site have a minimal footprint and the pathways are permeable to allow water to infiltrate into the ground, thus reducing the potential for flooding. The use of local timber and CdTe solar panels, both of which have a relatively small carbon footprint, also ensures the project employs climate-sensitive design.