Luma-Flow LAGI2025 Fiji Nil Padhiar & Ryan Gaspard - MSU Denver

1. Concept Narrative

The Fiji project blends sustainable energy and water collection with organic-nature inspired design. Using locally sourced material where applicable, Aluminium, stainless steel, and photovoltaic panels. This system integrates a solar canopy with water collecting leaf-like structures along a tree sculpture. At its base lies a gathering area shaded by the panels and sculpture above, with woven tarps made by the local community. With five sculptures in total the area will offer an educational and cultural experience, while supporting climate resilience.

2. Technical Narrative

This design will collect both solar energy and rainwater. This system utilizes 500w panels (7.4ft x 3.72ft). Each tree will have 35 panels which will create an output of 17.5kW.This installment would collect and store rainwater in two different places, in an underground cistern and in each of the pods protruding from the branches of the structure. This would allow for an average of 25,000 gallons of water to be stored and saved per tree. With a total of five trees this would meet the threshold of the 100,000 gallons of water and hit 87.5 kW needed for the Marou people.

These systems were chosen because they would be easily repairable –A widespread size of solar panel would make it easier for replacing if there was damage to one.

3. Prototyping and Pilot Implementation Statement

Our team will use an iterative and community focused approach for pilot implementation. Starting with basic 3D models to explore form and function, our team would then share this research and design data with local communities to get feedback and support from artisans and builders in the area. Using local resources where applicable the process will support community ownership, build local skills, and ensure long term success.

4. Operations and Maintenance Statement

This system would be self sufficient and be able to collect and produce energy. Residents would need to clear any blockages of the solar panels that may occur during the year. The people of the Marou village would need to travel to the grove inorder to acquire water. There will need to be yearly maintenance to ensure the solar panels are still undamaged and still work properly and will continue to provide energy and water for years to come.

5. Environmental Impact Assessment

Some of the major environmental impacts our team is primarily concerned with are; Waste during construction, Disruption to local ecosystem, visual impact, water runoff, Material lifespan, and wildlife interference notably birds. To mitigate building impact we would design to have the majority of the construction be made of prefabricated materials that are delivered to the site ready to assemble, and design for disassembly and recycling.