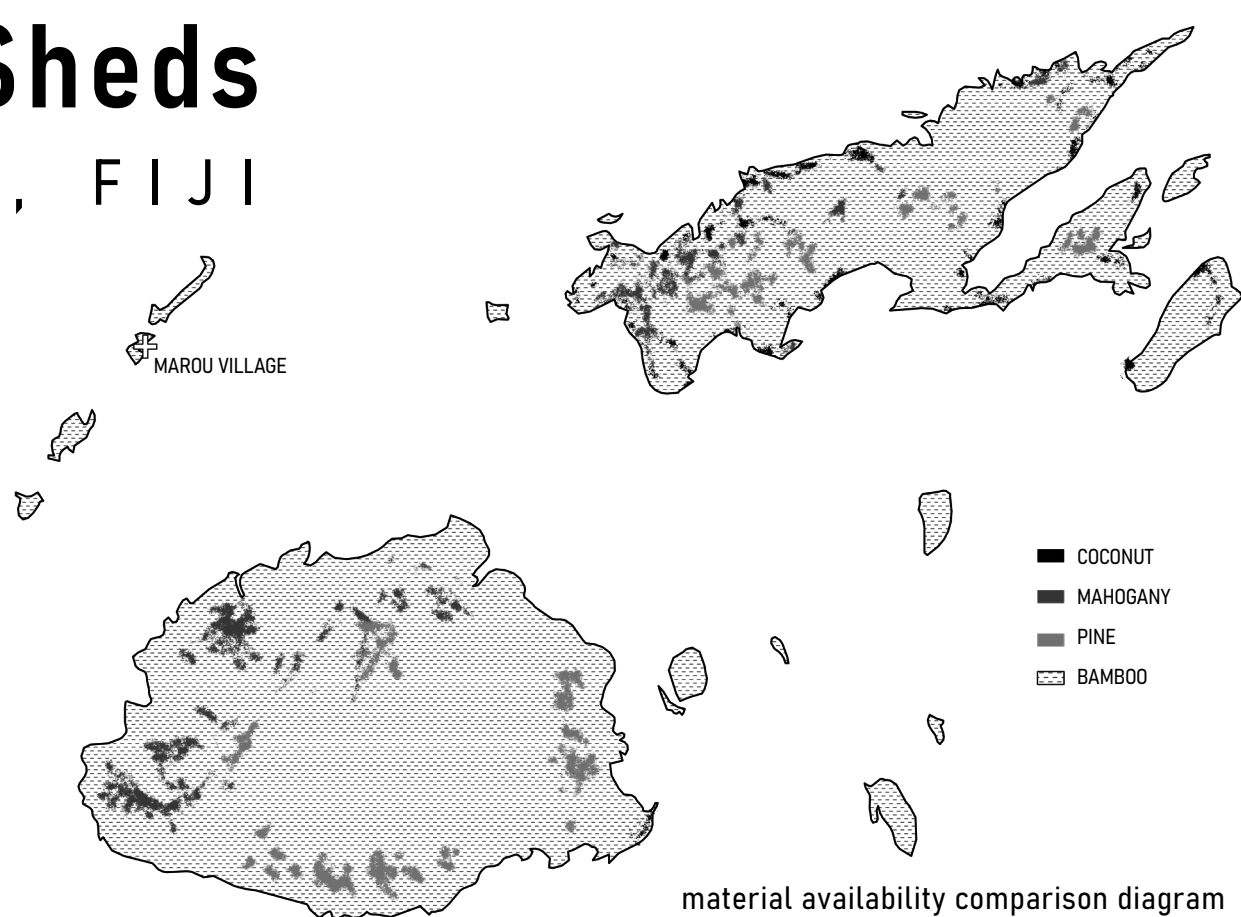


Plug-in Solar Sheds

MAROU VILLAGE, FIJI



Overview

The *Plug-in Solar Sheds* is a field of modular structures that harvest natural resources to produce clean, renewable energy for the local residents of Marou Village.

The design responds directly to the two pressing needs of Marou Village—access to fresh water and reliable electricity—by implementing a shared modular structural frame that houses two possible energy units—the solar unit and the water unit. Building upon local architectural and cultural heritage, the sheds are configured as distorted thatched roof, referencing the Fijian traditional “bure” or “vale” typology. This provides a sense of familiarity and meanwhile offers a playful form and space for something new as focal points of gathering, allowing the community to connect with nature while participating in the energy production and harvesting cycle. Each singular module measures 4.5m x 4.5m x 4.5m. The solar unit provides shaded area for potential crop production—a mini version of agrivoltaics for local crop beds. The water unit shares the same geometric profile as the solar unit, and utilizes an array of soft sails for directing storm water into a bamboo basin below. The basin collects the drained water into portable filter tanks. Movable carts with filter tanks can be swapped once filled. The fresh water can be directly used for irrigation or other daily uses. Larger sheds are designed by chaining singular shed modules in linear or parallel fashions. By connecting and mirroring singular units, larger covered zones are created for housing various community events, while nested uncovered courtyards emerge as part in forms of cross-pathways or visual axes. These plug-in sheds vary in size and configuration, ranging up to 20 meters long and 9 meters tall for multi-functioning structures.

Pilot Implementation, Maintenance, and Environmental Impact

The design utilizes locally sourced materials (including bamboo and straw that are readily available throughout the island) and construction techniques, allowing for adaptable workflow and collaboration with local community. The design team will learn from local craftsman, and will specify material, schedule, and construction details, along with customized hardware and tectonics through detailed drawings and video demonstrations.

The proposal learns from the findings of the VANUA project that a robust structural frame is the key for sustaining from natural catastrophe such as cyclones. However, instead of abandoning thatch material altogether for something more permanent, we embrace the environmental advantages of straw and thatch, and we envision alternative tying and paneling methods that allow additional bond and easy replacement. A thin layer of red bamboo at the backing of the solar and thatched panels introduces filtered sunlight while provides porosity for airflow, alleviating possible damages from strong wind. The panels can be easily remade with local techniques. With a 30-40 years lifespan overall, blocks of thatch could then be recycled afterwards for fertilizers.

The project intends to create no harm to the existing ecosystems. Proper installation and maintenance will assure its longevity and long-lasting positive impacts.