**Concept Narrative**

The Degei Solar Array in Marou Village, Fiji’s Yasawa Archipelago, blends renewable energy with cultural reverence for Degei, the serpent god. Its timber-based, serpentine design integrates with the coastal landscape, prioritizing scalability and ecological care. **Phase 1** delivers clean energy, shaded “landscape rooms,” agricultural strips, and single retention ponds for irrigation. **Phase 2** enhances water harvesting with damming to create multiple retention ponds, boosting agricultural resilience and biodiversity.

Inspired by Degei’s form, the array optimizes solar exposure and channels runoff to irrigate crops like taro, enhancing soil fertility. Shaded communal spaces beneath the panels, lined with stone and timber, host gatherings and cultural activities, reflecting Marou’s traditions. **Phase 2** expands ponds with interconnected channels, supporting more crops and wetland habitats.

Prefabricated timber modules allow easy assembly with minimal concrete, preserving soil. **Phase 1** establishes the core array, while **Phase 2** integrates additional modules and stone dams for expanded water retention. The array’s form, a visible landmark, symbolizes sustainability and heritage. Local artisans ensure craftsmanship reflects community identity, merging energy, water conservation, and cultural reverence into a resilient model for the Yasawa Archipelago.

**Technical Narrative**

The Degei Solar Array employs a timber-based system for Marou Village, integrating renewable energy with Fijian cultural elements. Locally sourced hardwood forms prefabricated modules with adjustable brackets, supporting lightweight photovoltaic panels tilted for optimal solar gain. **Phase 1** installs the core array and single retention ponds, while **Phase 2** adds modules and stone dams for multiple ponds, enhancing water storage.

The serpentine layout aligns with coastal topography, moderating runoff into ponds for irrigation. Native plants stabilize soil, and shaded “landscape rooms” with timber canopies support communal activities. **Phase 2** expands agricultural strips and pond networks, fostering biodiversity. Minimal concrete footings preserve soil, and pre-planned expansion zones ensure scalability.

Modules are assembled using traditional techniques, with treated timber resisting Fiji’s climate. Panels meet current energy needs, with surplus stored in batteries. **Phase 2** increases energy capacity and water retention, supporting larger crop yields. The serpentine form reflects Degei’s mythology, and landscape rooms with mats blend tradition with function, offering a sustainable, scalable model for Pacific Island communities.

**Prototyping and Pilot Implementation Statement**

The Degei Solar Array’s prototype validated its design for Marou Village, testing functionality and cultural integration. A three-module prototype, built with Fといった

System: Fijian hardwood, supported photovoltaic panels and was installed near communal areas. **Phase 1** tested energy output and single retention ponds, while **Phase 2** plans to prototype damming for multiple ponds.

Local artisans mastered tool-light assembly, aligning with Fijian traditions. The serpentine layout optimized solar gain and channeled runoff for irrigation, with native crops tested along the array. Shaded “landscape rooms” with timber canopies were refined for teaching and gatherings. **Phase 2** will test interconnected pond systems to enhance water storage.

The treated timber resisted Fiji’s climate, and natural ventilation improved panel efficiency. Minimal footings preserved soil, and adjustable brackets simplified tilting. The prototype met energy needs, with scalability ensured. Community input shaped the serpentine form honoring Degei, setting the stage for full implementation with **Phase 2** expanding water and ecological benefits.

**Operations and Maintenance Statement**

The Degei Solar Array ensures efficient operations and low maintenance for Marou Village. Photovoltaic panels generate energy, with surplus stored in batteries managed by a local team. **Phase 1** meets current needs, while **Phase 2** expands capacity and water retention with multiple ponds.

Treated hardwood requires annual joint inspections, with repairs using local materials. Panels are cleaned quarterly, and adjustable brackets allow seasonal tilting. **Phase 1** maintains single ponds and native plantings, while **Phase 2** oversees interconnected pond networks and expanded crops. Shaded “landscape rooms” are kept functional by residents, with timber canopies and stone linings inspected regularly.

Training empowers locals to manage the system, with artisans leading maintenance and youth learning stewardship. A fund from surplus energy sales covers parts, ensuring sustainability. **Phase 2** enhances ecological maintenance, supporting biodiversity. The array integrates with communal life, its landscape rooms reinforcing its cultural role while honoring Degei’s legacy.

**Environmental Impact Assessment**

The Degei Solar Array minimizes environmental impact in Marou Village, using minimal concrete footings to preserve soil. Its serpentine layout follows natural contours, avoiding deforestation. **Phase 1** integrates single retention ponds and agricultural strips, while **Phase 2** adds multiple ponds via damming, enhancing water storage and biodiversity.

Retention ponds capture runoff, reducing erosion and irrigating native crops. Surrounding plantings stabilize soil and support wildlife, while shaded “landscape rooms” prevent compaction. **Phase 2** expands wetland habitats, boosting ecological resilience. Elevated panels lower ground temperatures, fostering shade-tolerant species.

Energy production cuts fossil fuel use, reducing emissions. Locally sourced hardwood lowers transport impacts, and natural ventilation enhances efficiency. **Phase 2** increases energy and water benefits without disturbance, thanks to pre-planned expansion zones. The array fosters biodiversity, water management, and climate resilience, ensuring Marou thrives in harmony with its environment and Degei’s cultural significance.