**SOLAR TAPA**

**Concept Narrative**

Our design was based on the idea that the surface covered by the solar panels should not only serve an energy function, but also be a valuable space for the community. Drawing on Fiji's agricultural culture, we designed the solar farm as a community garden, consisting of farmland, catchments and energy production units organised around a central structure.

The upper level of the main building can be used for a variety of community purposes: it can function as a community centre, education space, crop processing, a place for markets or even as an accommodation. The lower level houses the rainwater harvesting tank, the mechanical room for the solar panel system, a wet room - which can be converted into a washroom or kitchen if required - and agricultural storage.

Connected to the central building, each production unit has its own solar roof, which not only produces energy but also collects rainwater for irrigation. The layout was inspired by a local tapa pattern: the pattern of plots, solar panels and paths connected to the hourglass-shaped main building creates an organically expanding, fabric-like pattern on the hillside. This pattern is echoed on a smaller scale: the solar panel roof of the central building is perforated by triangular coloured glass panels that create a flower-like pattern. The interplay of light and shade creates an ever-changing, living atmosphere in the interior communal space.

**Technical Narrative**

Natural, locally available materials were a primary consideration in the design of the built environment. The supporting structure is made from plant materials and raw materials found in the surrounding areas: the main supporting columns, stiffening beams, lattice girders and roof elements are made from the indigenous Intsia bijuga wood. Bamboo was used for additional structural elements and shading, while coral stone was used to support the retaining walls of the lower level.

Polycrystalline solar panels were installed on the roof of the central building and above the associated agricultural plots. One unit of land covered with 400 m² of solar panels has a nominal capacity of approximately 80 kW, providing approximately 87 600 kWh of renewable energy per year.

The mechanical units for the solar system are located in a technical space of about 4 m² behind the water tank. The building is supplied with rainwater by a 7200 litre collection tank with a water filter, which collects rainwater from the 165 m² roof surface. This roof can collect up to 396 000 litres of water per year in Fiji's weather conditions.

The tank not only provides access to the water block inside the building, but also to an external water intake point on the lower level. From here, the local community has direct access to drinking water, or the slope of the terrain allows for gravity distribution of water, for example by draining it to the village.

**Prototyping and Pilot Implementation Statement**

The prototype development process will be carried out in close partnership with the local community, involving them from the very beginning in the logic of design, implementation and use. Our aim is to create not just a building, but a collectively understood and owned system in which local people are not only users, but also active participants.

The first phase of the development process will be the main building, which will be able to generate energy and collect rainwater on its own - thus offering functionalities that can be used independently and immediately. The second phase will involve the construction of agricultural plots and associated solar grids, providing the opportunity to expand the prototype and deepen community involvement, for example through local knowledge and labour.

In the full-scale implementation, community engagement is not only at the technical or physical level. Our design is fundamentally an open system: the parcel allocation inspired by the tapa model, for example, is not a fixed form but a proposal that can be further developed and shaped with local residents, taking into account layers of cultural meanings and local priorities. The same is true for the colours, which are selected on the basis of the local built and natural environment, but whose final form can also be subject to community decision-making.

The longer-term goal of the development is to create an adaptable, modularly extensible model that can be used in other regions, while always adapting to local conditions, community needs and material use. This approach ensures not only technical sustainability but also social embeddedness and long-term acceptance.

**Operations and Maintenance Statement**

Regular maintenance is essential for the long-term sustainability of the building, especially of the natural materials and rainwater harvesting system. The rainwater that reaches the roof surface is cleaned by a multi-stage filtration system, including leaf filtering nets, sedimentation sections and a fine filter before the water reaches the tank. Nevertheless, periodic inspection and cleaning of the water pipes is recommended, as large diameter pipes can be prone to the ingress of plant debris or small animals. An opening at an accessible height on the upper level of the building has therefore been designed to facilitate maintenance. The water storage tank also requires regular inspection to ensure that the water stored in it does not become stagnant and contaminated. To maintain hygiene, it is important to ensure ventilation and maintain water circulation.

The natural wood and bamboo structures, such as support posts, lattice supports and shades, require periodic surface protection. Every few years, a treatment cycle adapted to the local climate requires treatment with natural oils or other environmentally friendly products to help prevent rotting, discolouration or pest infestation. Solar panels also require regular surface cleaning - especially after periods of high humidity or dust - to maintain their efficiency.

The responsibility for the day-to-day operation and cleaning of the water block and storage areas rests with the current users - whether for community programmes, agricultural processing or educational use.

It is important that the building does not appear as an externally “assigned” object in the landscape, but becomes part of the community's own processes. By allowing both the design of the tapa pattern and the colour scheme of the building to be the result of a community decision, a real sense of attachment and ownership can be created for local people. The aim is not to ‘hand over’ a finished building, but to create a place that is shaped and run together.

**Environmental Impact Assessment**

During the installation process, we have sought to ensure that the intervention has the smallest possible ecological footprint and that the building complements the existing natural environment rather than overwhelming it. The design and use of materials give the building a light, natural appearance: the structure, set into the hillside, looks more like a butterfly or flower from a distance than a traditional building. The floating roof forms, the coloured glass surfaces and the loose integration do not break up the proportions of the landscape, but subtly blend into the rhythm of the surroundings.

The placement of the central building and associated agricultural units has avoided the disturbance of native vegetation and trees. The farmland is not given fixed functions, but the local community can decide what they want to grow - so the system is flexible to adapt to seasons, needs and knowledge. The solar panel structures do not take away from the growing area but provide shading and water harvesting, reducing evaporation and promoting sustainable irrigation.

The rainwater harvesting system is equipped with filters to protect the environment from pollution, while natural materials (Intsia bijuga, bamboo, coral stone) are locally sourced, reducing the transport footprint. Designing to blend into the landscape is not only aesthetic but also ecological: the building and its surroundings are made usable without disrupting the biodiversity balance.

In the long term, our aim is not just to reduce the pressure on nature, but to create a system that works in harmony with local ecosystems and uses their resources in a responsible, regenerative way. Community-engaged operation and maintenance will help maintain a balance between human presence and the natural environment.