# 1.Concept Narrative

Having studied the traditions of Marou village, we have recreated a concept that returns to the origins of Oceania. The project is based on the principles of sustainability: the use of natural materials, the revival of crafts, the preservation of oral traditions and communal farming. As in the past, there is no place for excessive consumption here every element of architecture reminds that a person is a part of the whole.

The village of Maru has become not just a symbol of cultural heritage, but a living laboratory where the past and present merge, proving that the wisdom of the islanders, their ability to live in balance with the ocean and the jungle, is relevant even in the modern world.

The Fiji Islands, surrounded by an endless ocean, have had a unique culture for centuries, closely linked to nature. Their distinctive feature is their massive, sloping roofs. They resemble the sprawling crowns of tropical trees, which not only protected from the scorching sun, but also served as a reliable shelter during frequent storms and cyclones. Families found safety under their shadow, and communities maintained unity even in the harshest times.

Architecture inspired by nature. The wide roof, like a tree, distributed the force of the wind, and natural materials provided natural ventilation and thermoregulation. Such architecture did not resist the elements, but "cooperated" with them, using their energy.

The idea of huts on stilts inspires the creation of modern sustainable shelters. The station has a transformer roof, with installed solar panels, the shape of which adapts to the force of the wind, as did the flexible leaves of palm trees. Biodegradable composites that replicate the strength and lightness of traditional straw can also contribute to the image.

Modern rainwater harvesting systems and "green" roofs with vegetation can be a continuation of the principle of housing the peoples of Polynesia and Milanese — to provide shelter and resources at the same time.

In addition, a sustainable shelter is a reminder of the value of community. A large roof united the family under one shelter. Similarly, modern eco-settlements can be designed around shared spaces, strengthening social ties in the face of climate challenges.

# 2.Technical Narrative

Regenerative energy supply and water supply systems.

The roof of a stable shelter.

The roof consists of 3 types of panels: solar panels (BIPV type), translucent panels and panels made of composite materials.

The station structure is assembled at the construction site from ready-made elements as a construction kit. Each of the modules has a low weight, the material of the spatial frame is aluminum. The vertical frame is installed using an excavator and a strong cable. The panels are installed in the following order: solar panels, composite panels, translucent. The coefficient of difference between v1 and v2 stations is 0.8. Each group of modules has its own index and the size of the final modules depends on the version (v1,v2)

Each of these species has the ability to collect water in a water storage. There are 2 types of storage in our offer: clean rainwater that enters the storage directly from the roof of the station, as well as dirty water that enters from storm drains around the perimeter of the station into a separate tank with water, which can later be used to irrigate plants.

In addition to the rainwater collection system with filtration, the station diverts the collected water to cassava-growing areas. The volume of rainwater collected also includes the reuse of dirty water for domestic needs.

The surface area that collects water in the storage is approximately 1000 m² (v1 station) Taking into account the average amount of precipitation in one year in Fiji (234 mm), a preliminary calculation was made of the volume of water collected in one year; in total, 234,000 liters of water will be collected in both water storages (clean and dirty rainwater) per year (70,000 liters-dirty tank,

164,000 liters clean tank)

Square of solar panels is a 360 sq.m , 1 sq.m. = 225 Watt

The amount of electricity that the structure can generated is 360\*225=81000 Watt **81 kW > 75 kW was needed.**

The rest of the energy will be used for the household needs of the settlements. The calculation was performed for a larger station (v1)

If 81 kW is generated in 10 hours, then the **average annual installation capacity is 29,565 kW.** Depending on the needs of the community, the number of solar panels can be increased or decreased.

The price per square meter of the solar panel will be $296 USD (225 Watt) where 1 Watt of electricity will be $1,3 USD excluding logistics.

# 3.Prototyping and Pilot Implementation Statement

By participating in the competition to create a sustainable climate station, our team focuses on integrating innovative technologies, respecting local ecosystems, and actively engaging the Marou community. The prototype of the station will be developed taking into account the tropical climate, cultural characteristics, and sustainability requirements, with the support of design bureaus with experience in designing stations in difficult climatic conditions.

**4.Operations and Maintenance Statement**

The sustainable shelter will be operated and maintained throughout its lifetime by the local community.

Communities, depending on their electricity needs, can increase the number of stations, as well as regulate the percentage of electricity generation and the volume of water storage by changing the modulus coefficient of structures and the volume of water storage.

Public functions can be replenished and changed over time, since the main idea of the station is to provide opportunities for the community to change the “life” of the station based on their needs.

**5. Environmental Impact Assessment**

The power plant, harmoniously integrated into the island's landscape, is designed with minimal impact on the natural ecosystem. During the construction, special attention is paid to the preservation of the natural relief. Overheating of the structure and transfer of excess heat to the environment could be one of the potential problems. However, this problem has been solved by using innovative composite panels with extremely low thermal conductivity. These materials effectively insulate the heat generated by the plant, preventing its accumulation and spread. Due to this, the heat output to the ecosystem remains predictable and controlled, without disturbing the temperature balance of soil, water and air.