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Implemented by:
giz Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH

In cooperation with:
The Ministry of Energy and Mineral Resources, Republic of Indonesia

Expanding Renewable Energy Impact on Small Island

Case Study - Kaledupa Island

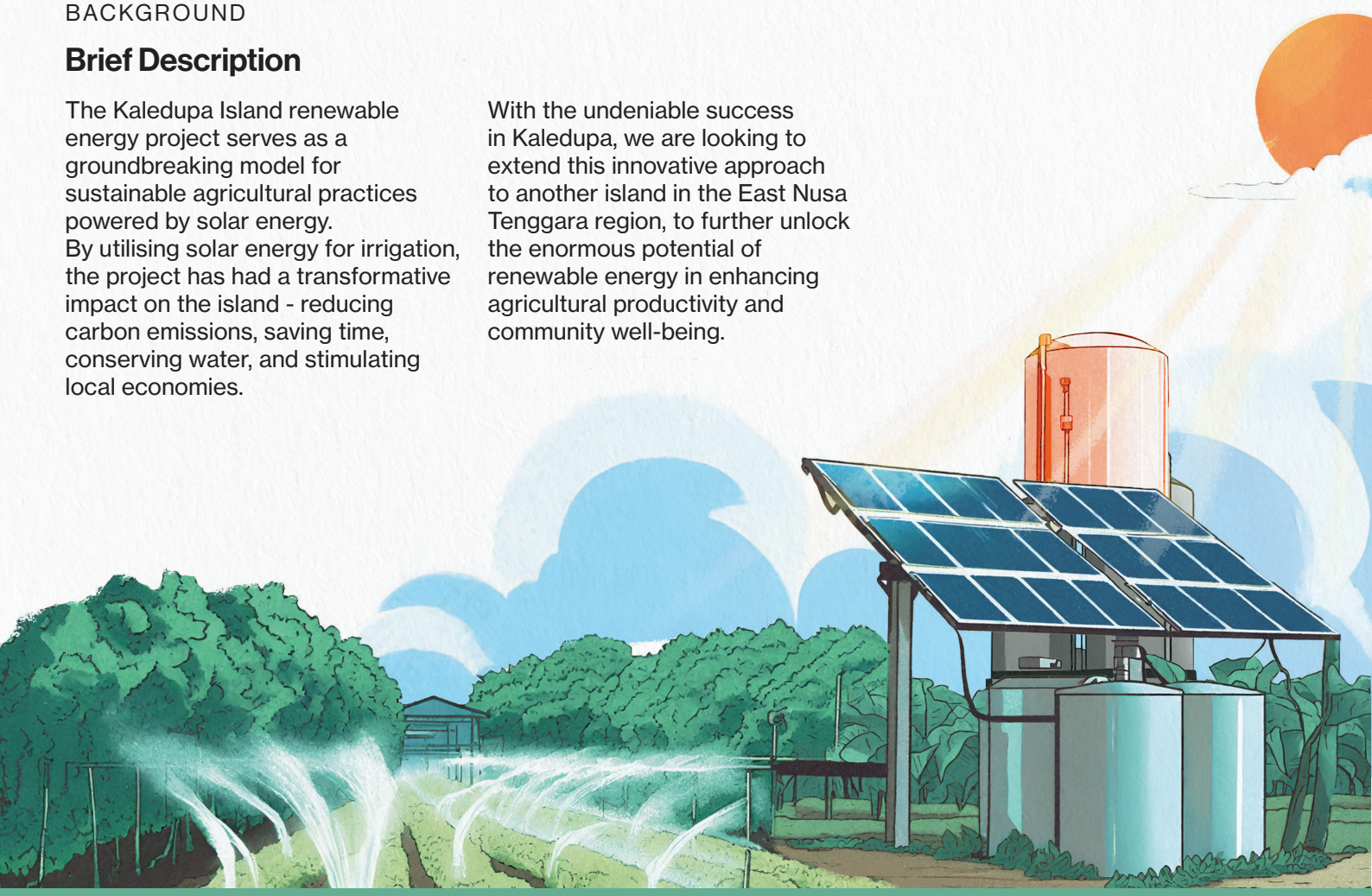
Wakatobi Regency, Southeast Sulawesi Province, Indonesia.

BACKGROUND

Brief Description

The Kaledupa Island renewable energy project serves as a groundbreaking model for sustainable agricultural practices powered by solar energy.
By utilising solar energy for irrigation, the project has had a transformative impact on the island - reducing carbon emissions, saving time, conserving water, and stimulating local economies.

With the undeniable success in Kaledupa, we are looking to extend this innovative approach to another island in the East Nusa Tenggara region, to further unlock the enormous potential of renewable energy in enhancing agricultural productivity and community well-being.



Why PV-Agri Kaledupa Pilot Matters?

Imagine a place where the sun's energy helps grow food and powers homes. That's what's happening on Kaledupa Island, thanks to the PV Agri project.
This isn't just about saving electricity; it's about building a brighter and cleaner future for everyone. When we talk about using renewable energy like solar power, Kaledupa shows us it's possible and can make a big difference. For the people living there, this project means better farming and a happier, more sustainable life.

The initiative to implement a photovoltaic-based agricultural system (PV-Agri) is in line with efforts to achieve the Sustainable Development Goals (SDGs), including clean water, affordable energy, and economic growth.

1. | Social Economic and Location of Kaledupa

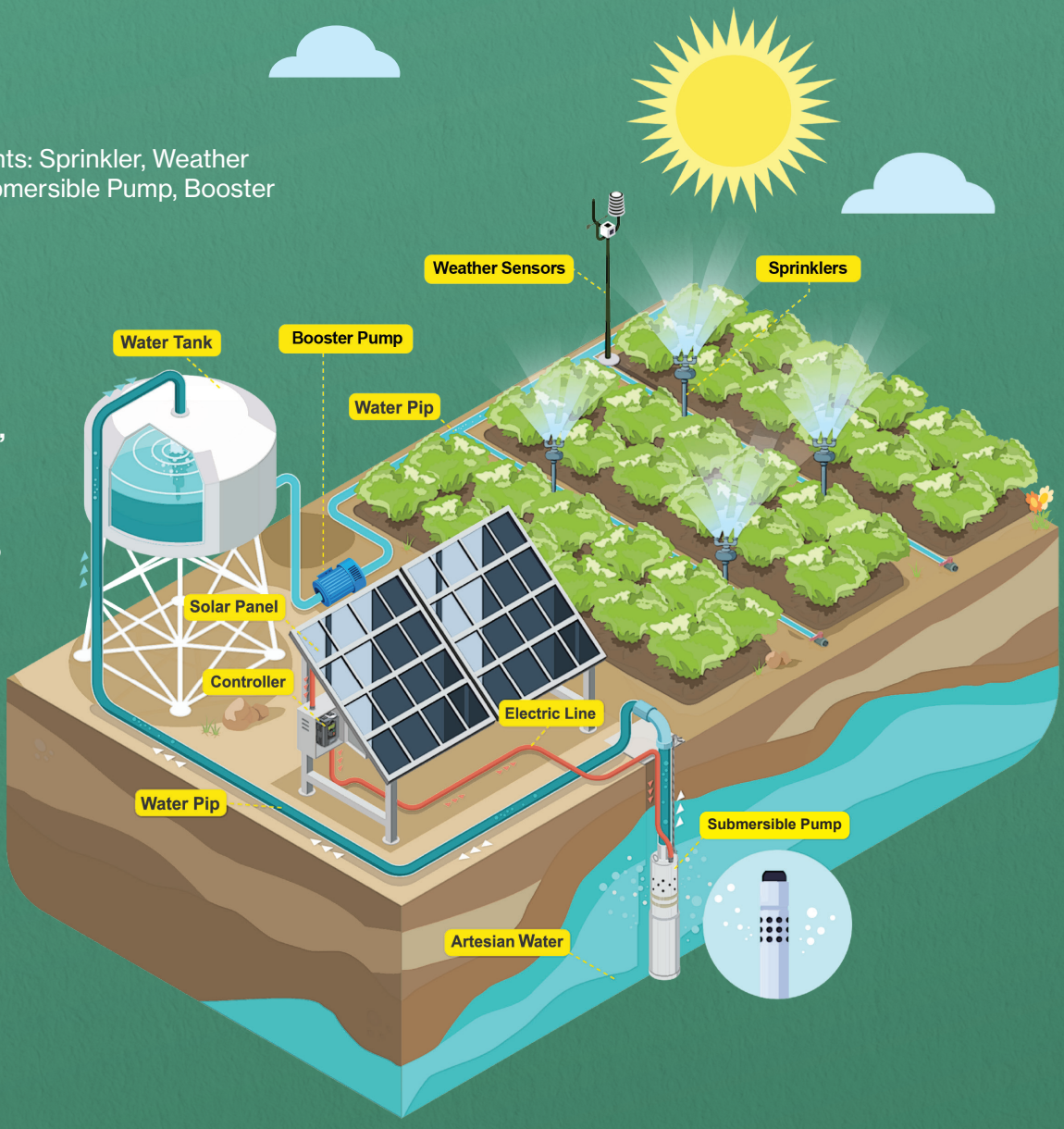
Kaledupa Profile – Infographic Conditions

Electricity Access: Limited to 14 hours/day from diesel generators
Transport: Diesel-based boats
Cold Chain Tech: Scope for enhancement
Main Produce: Copra

2. | Design Layout & Installation

3. | Quick Fact Box

PV Agri Installation:
Design Layout Components: Sprinkler, Weather Sensors, Water Tank, Submersible Pump, Booster Pump, and PV Array.



Impacts

Carbon Emission-Free, 100% from Renewable Energy sources

Timesaving, up to 60% shorter watering time

Water Conservation, **up to 70%**

Economic Impact: Improved farming production, full bed utilization, and lower operational costs

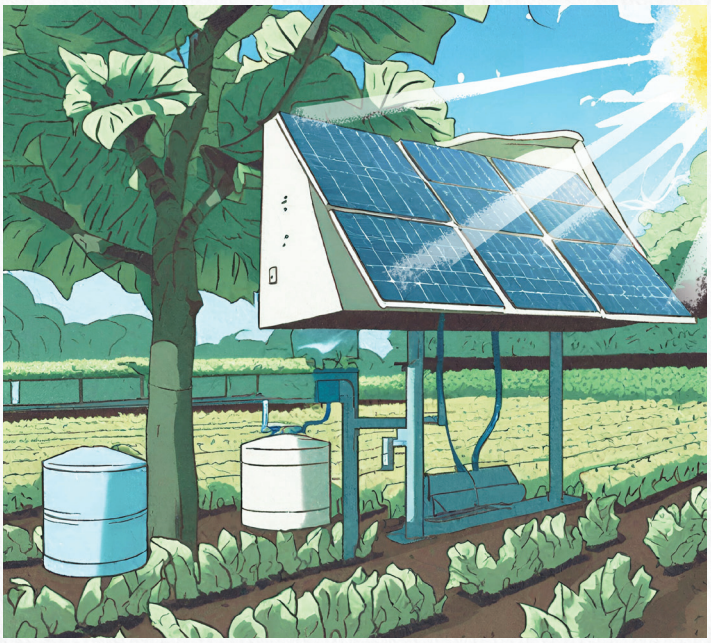
1. | Activity

Initiation of the PV-Agri System in Kaledupa

The journey to realizing the PV-Agri system in Kaledupa started in 2019 when GIZ, under the REEP project, visited the island. With a daily electricity supply of only 14 hours powered by diesel generators, there were evident challenges, including the lack of ice for preserving fresh fish catches and the manual irrigation of vegetable farms. The community needed a sustainable solution.

PV-Agri Installation

Following the initial survey and understanding of the island's unique challenges, the GIZ team introduced the PV-Agri system. This smart irrigation system harnesses the sun's power, providing clean energy for the island's agricultural practices.



2. | Process

Survey and Feasibility Study

The team first conducted a detailed survey to understand the unique challenges faced by the island's inhabitants due to inconsistent electricity supply.

Design and Implementation

With insights from the survey, a customized PV-Agri system was designed for Kaledupa. This included a PV array, a submersible pump, a lithium-ion battery, a smart irrigation system with sprinklers, a booster pump, and environmental sensors.

Training and Handover

Once installed, the local community was trained on the new system's operations, ensuring they can independently manage and maintain the PV-Agri system. This was crucial for ensuring the project's long-term success and sustainability.

1. | Main Findings

Challenges and Solutions

a. Limited Electricity Supply

Before: The island had electricity for just 2 hours a day, making farmers rely on manual irrigation.

After: Now, electricity is available in total 14 hours from 16:00 to 06:00. The 1.8 kWp PV-powered pump ensured a consistent power source for sustainable farming.

b. Intense Labor Work

Before: Farmers irrigated their fields manually for 6 hours a day using communal water tanks.

Solution: Automatic irrigation with sprinklers significantly reduced manual labor and water usage.

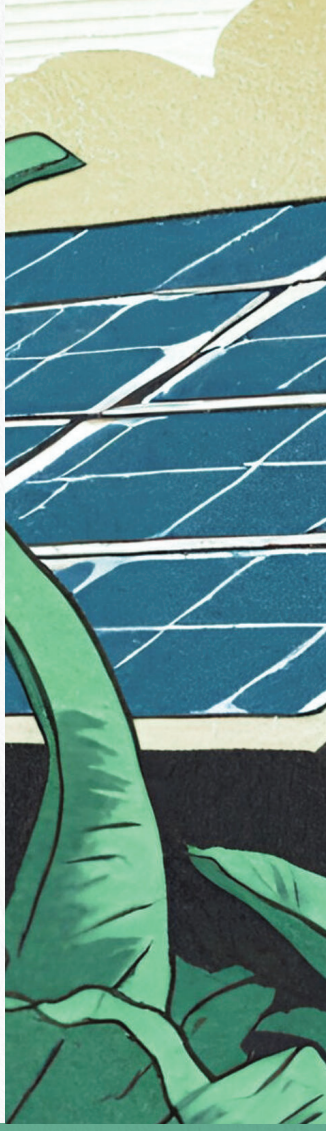
Economic & Environmental Benefits

Water Savings & Time Efficiency:

PV-Agri has saved 70% of water used for irrigation, and farmers like Pak Lanuli now conserve 3,500 liters daily.

Increased Productivity & Reduced Costs:

Irrigation time has been cut in half, giving farmers an extra 1.5 hours daily. The solar-powered system also reduced energy and operational costs.



2. | Testimonials

“Last year (2022), panel equipment, water towers, and sprinklers were installed. It was very helpful. I can water crops more easily and faster. I used to water crops from 5-8 AM and 4-8 PM. Now it only takes 1.5 hours each time”

LANULI
Vegetable farmer
from Tampara Village

For more information or inquiries

Contact Information:

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