

Sustainable Sea Cucumber Farming

Cassidy Plautz¹ with Under the Wave Organization², June - August 2026

The Organization: Under the Wave

Under the Wave (UTW) is a marine conservation NGO based in Matemwe, on the island of Unguja in the Zanzibar archipelago.

UTW projects are climate-focused but informed by the needs and knowledge of the Zanzibari people, e.g. identifying dolphins and teaching local aquariums about best practices.



The Motivation: Sea Cucumber Farm

Fishing and aquaculture are essential for the food and financial needs of Zanzibar, but overfishing has resulted in the depletion of sea turtles, fish, and wild sea cucumbers.

Long-term sea cucumber farming supports local populations while preserving marine wildlife.



The Specialization:

Accessible Data Monitoring Methods

UTW is establishing a pilot farm for observation to determine if sea cucumber aquaculture can be a sustainable livelihood in the region. For my LiA project, I determined what variables should be monitored and developed attainable data collection procedures using cheap local materials. Emphasis was on making the methods accessible, as the farm will ultimately be run by Zanzibari women.

The project aligns with several UN sustainable development goals:

Primary
SDG:



Secondary
SDGs:



→ → → Specific Measurable Achievable Relevant Timely Goals ← ← ←

1. Pictorial SOPs

- ✦ Write Standard Operating Procedures for monitoring the farm which are understandable for a non-scientific, non-English speaker
- ✦ Create a document detailing how to record sea cucumber length and weight which is clear without written captions
- 🏆 Only involves six pages of writing
- 📖 Enables information transfer regardless of language or literacy
- 🕒 By Week 4, when sea cucumber

2. Literature Review

- ✦ Review literature about sea cucumber aquaculture, focusing on recent articles about farms in Zanzibar (+Tanzania, East Africa, Indian Ocean)
- ✦ Write up the findings journal-style, including potential research questions
- 🏆 Can be scaled to include fewer sources depending on time pressure
- 📖 Pinpoints future investigations; shortens preparation time needed for work by future UTW members
- 🕒 By the end of Week 6

3. Accessible Data Monitoring Methods

- ✦ Develop methods for measuring two key variables (from literature) which do not require precise equipment or intensive scientific knowledge
- ✦ Do proposed methods at UTW
- 🏆 Some literature basis for methods
- 📖 Allows UTW and other NGOs to help with the farm more accessibly
- 🕒 By Week 4 (essential variables) / by the end of Week 6 (others)

4. Data Collection

- ✦ Collect and interpret data from the sea cucumber farm, including sea cucumber length and weight over time
- ✦ Confirm data is recorded for planned collection dates/times
- 🏆 Equipment for basic monitoring is present at UTW
- 📖 Supports analysis of farm viability and whether cucumbers can grow to market size in the farm
- 🕒 By the end of the data collection period (dependent on tides etc.)

✓ Completed on time

- Finished ahead of schedule
- Used my prior experience of graphic design and writing scientifically for a general audience
- Relied on help from colleagues to add Swahili captions

✓ Completed on time

- Gained a solid understanding of sea cucumber aquaculture, and challenges specific to Zanzibar
- Wrote up findings so they would be accessible to future volunteers
- Suggested potential future work

○ In progress

- Decided to add two more variables
- Established imprecise proof of concept for all methods in Zanzibar, but further lab work is needed to determine accuracy
- Will communicate results to UTW

○ In progress

- Created a database for data entry
- Weather delays meant data couldn't be collected until Week 6
- Collection and overall interpretation will need to be done by other staff, but I can help remotely

→ → → Reflecting Back & Projecting Ahead ← ← ←

Leadership and Character Development

Capacities. My most-developed capacities were *global citizenship*, *impact measurement and analysis*, and *creative ideation*. Given complete independence to design a project, I was tested to ensure that my work was doing the most benefit for the local community as possible, exploring all possible ideas and developing solutions to problems which arose spontaneously.

Change-Maker Values. I struck a balance between being *ambitious* and *fast*, as the time scale of the LiA constricted my ability to do everything I had planned to. Overall, I felt driven by my *curiosity*, since the subject matter really interested me, and created a positive feedback loop where learning new aspects of the issue inspired me to give more effort.

Character Dimensions. *Humility* was essential at the beginning, as I relied completely on my peers for guidance and translation, using *judgment* to decide when to use *drive* to push through and when to ask for help. Later, as unexpected setbacks affected my project, I focused on *temperance* to prevent burnout and stay focused on gradual, long-term change.



🎯 Future Objectives

- Verify proposed data monitoring methods so that UTW can have confidence in future measurements
- Contribute to data analysis when collection is complete
- Learn more about conservation efforts and how I can apply chemistry and physics to pertinent problems

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