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We are still developing and optimizing this protocol

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Sargassum Island Sustainability

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ABSTRACT

The purpose of this research proposal is to analyze the of sargassum harvesting and implementation for agricultural use on Moorea. Sargassum is increasingly growing in abundance and has been noted to have beneficial effects on the growth and yields of numerous plant species. This project seeks to observe if establishing and expanding the farming and harvesting of sargassum on Moorea could positively impact the productivity of low quality areas. Numerous bays have been seen to lose biodiversity as land/ sea use increases and nutrient run off enters the system. Sargassum has been noted to uptake high levels of nutrients and prevent eutrophication. This long term study will partner with local individuals to harvest and farm sargassum while conducting a long term study in the area looking for adverse reactions to the sea use changes.

MATERIALS

water testing equipment, rope, weights, snorkels, floats, measuring tape,

SAFETY WARNINGS

The ocean is an inherently dangerous place and thus necessary precautions in accordance should be taken

Pre- Establishment Monitoring

1 Sections of the bay will need to be identified. Sights should be independently selected from one another. Data will be primarily observed site specifically and thus similarities between all sites is

not required. Selecting slightly different sites between areas can also increase the scope and effective look at the efficacy of the program.

2 The water and bays will be tested for the following characteristics before seaweed farming begins. The data recorded will be as follows: hydrodynamic descriptors (currentology and flow) water column descriptors (salinity, conductivity, suspended solids, pH, temperature,) bacteriological descriptors (Escherichia coli and enterococci) biogeochemical characteristics and sedimentation (granulometry, C org., N org., heavy metals and pesticides) state of the benthic populations (which concerns only the lagoon stations) Density of living flora and fauna in the surveyed area excluding grown sargassum

3 Repeat Step 2 weekly over the course of a year

Establishing the Seaweed Farms

4 Once a year of water characteristic data has been recorded at each site, implementation of seaweed farms can begin.

5 Working with the local community, establish 3 seaweed farms. One at each of the selected sites in Autea, Via'are, and cook's bays. Each seaweed farm with grow Sargassum using 3 methods. These three methods hanging rope culture(vertical), long lining, and hanging rope(garland) can be observed in the figure below.

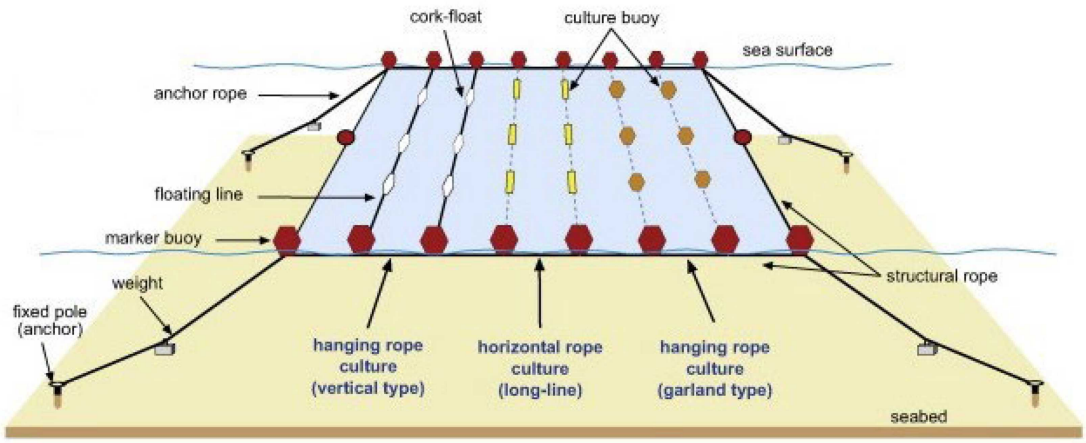
6 Similar to the coral gardens or pearl farms, create a grid system with floats and weights at each corner to create the base for the Sargassum to attach to. Make sure to set these farms in areas that do not disturb boat traffic. Each farm will be anchored to the ground in each corner of the rectangle and have floats running along the edge.

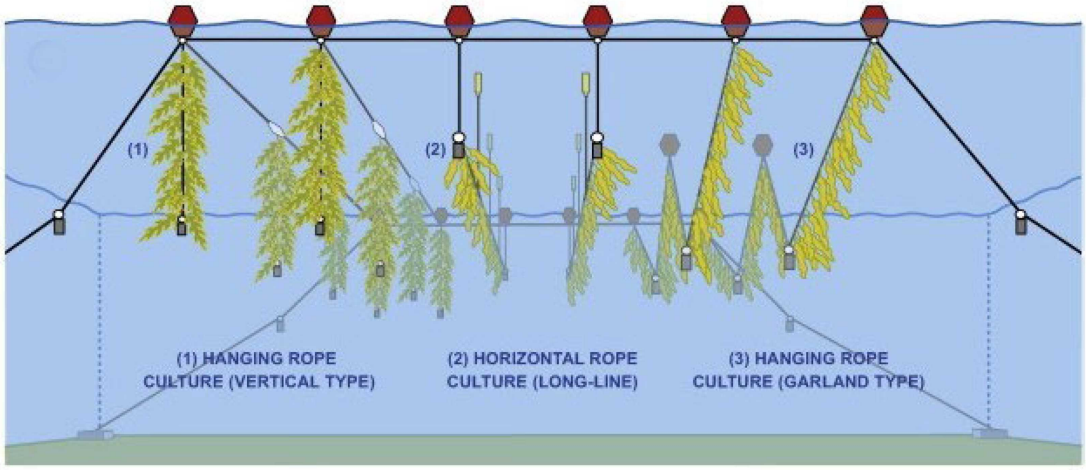
7 Once the base for the farms have been established begin by colonizing your Sargassum onto the rope chains.

8

9 It is important after establishing the seaweed farms sing the floats, anchors, and 3 growth types that control is shared with the local community. This will allow the continued success of these farms after the project has concluded and promote a positive, open dialogue with local stakeholders.

10





11 Once the seaweed has begun to grow continue to take measurements of the affomentioned categories. Also add recording the growth rate of these seaweed.

12 Three months after establishing these Sargassum farms, begin taking daily recordings of the water characteristics of the surrounding area and of the macroalgae itself. Once harvested, take sample measurements of the nutrient uptake by these seaweed.

Long Term Monitoring After Establishment

13 After the initial 1 year of data collection, continue to record the pertinent data, however, drop recording frequency to once a week(Each Friday). Continue to record data for a subsequent 5 years