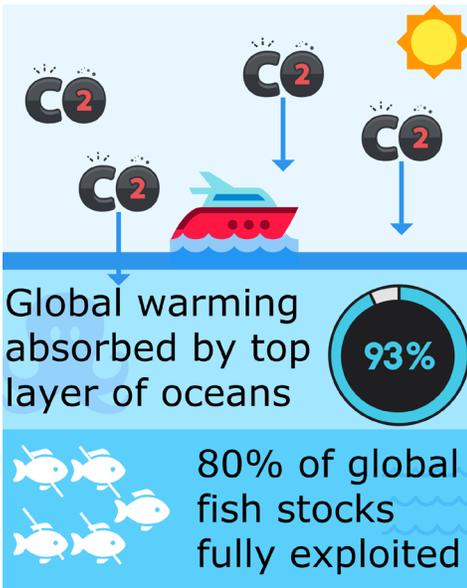


# Enhancing Coastal Community Value Chains with Marine Permaculture (CVC-MP)



## PROBLEM

Developing countries are the most vulnerable to food insecurity, which will be intensified by climate change. More reliant on small-scale agri/aquaculture, their populations are disproportionately hit harder when climate disruption decimates marine life and crop yields, impoverishing millions.

This problem only intensifies as the global population grows, forcing producers to fish and farm at alarmingly unsustainable rates. Already, most of the world's global fish stocks teeter on overexploitation or depletion, and farmers can see their agricultural land decrease by almost half as a result of climate disruption.

One possible remedy for these problems is seaweed mariculture, already a multibillion dollar industry in South East Asia. However, climate change severely hinders the potential of this market. Consequences of climate change such as warming oceans and low nutrients leave the seaweed vulnerable to parasitism and disease.

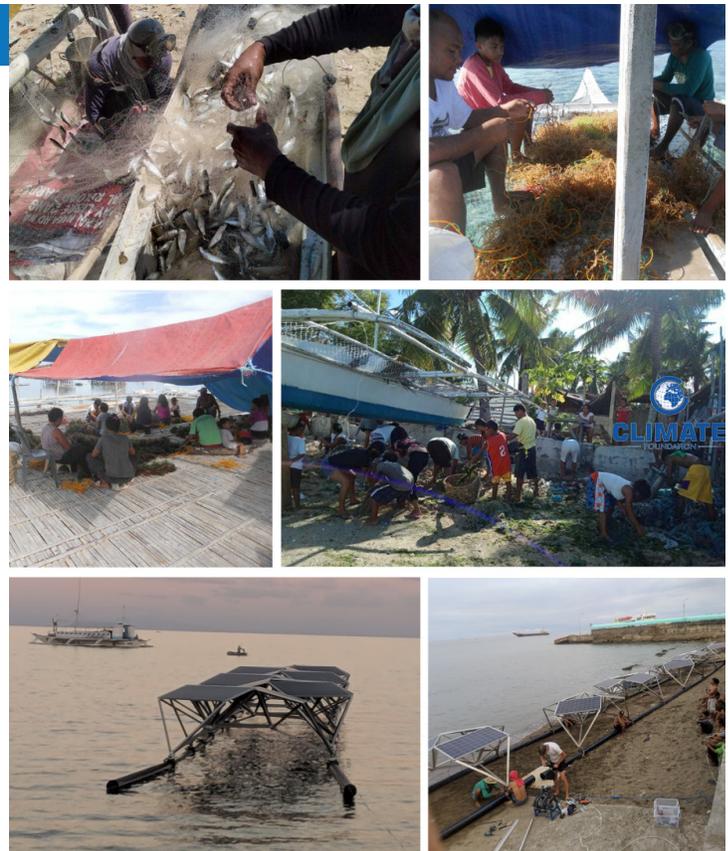
## SOLUTION

The Climate Foundation (CF) has worked for over a decade to develop technologies to achieve global carbon balance. One of the most promising are Marine Permaculture arrays - floating platforms that use wave energy to provide irrigation of nutrient rich waters for seaweed growth. These arrays offer a myriad of benefits as the seaweed provides a habitat to highly diverse marine species, reduces CO<sub>2</sub> levels in the water and air, and its extract can be converted into nutrient-rich fertilizer for agricultural lands. In fact, a Marine Permaculture array (of 100 hectare) can offset as much CO<sub>2</sub> per year as 457 American households emit.

To address climate change-induced challenges to seaweed mariculture listed above, MCDI as well as the Climate Foundation plan to station these arrays farther out into the open ocean and encourage community-led management of the arrays.

This plan will provide food, fish, fertilizer and jobs - which will improve the economy, lower the crime rate, make the community safer; improve the quality of life, and reduce the negative effects of climate change. These benefits multiply as participating communities motivate neighboring villages and the model expands, improving market efficiency in meeting demand.

These arrays have been used successfully in other countries and even have support from local governments, including Madagascar. On the project, Minister of Agriculture Fanomezantsoa Lucien Ranarivelo said, "I was amazed by this project, which I see as a revolution in the sustainable development approach in Madagascar and a lever to fight against poverty."



To find out more about CVC-MPs and how you can help, visit [climatefoundation.org](http://climatefoundation.org).

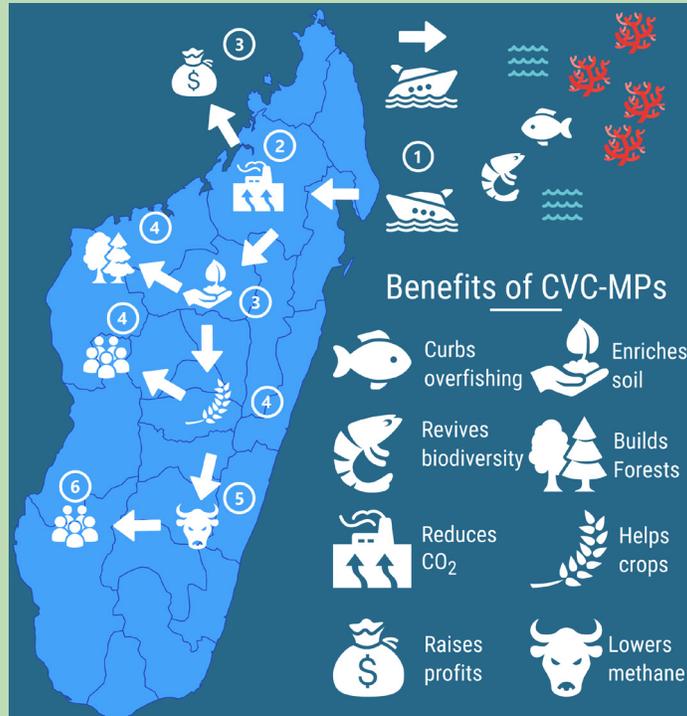
# PROCESS

## Phase I

We will test our systems in Madagascar and Tanzania. We then will educate relevant communities in those countries about the arrays (i.e., how to construct/manage the devices), what Coastal Community Value Chains with Marine Permaculture (CVC-MPs) are, and show them how to build the extract and composting processing facilities.

## Phase II

Leveraging on these outcomes, we will scale up the system by encouraging already participating communities to work with neighboring communities to build and expand CVC-MP networks.



## Phase III

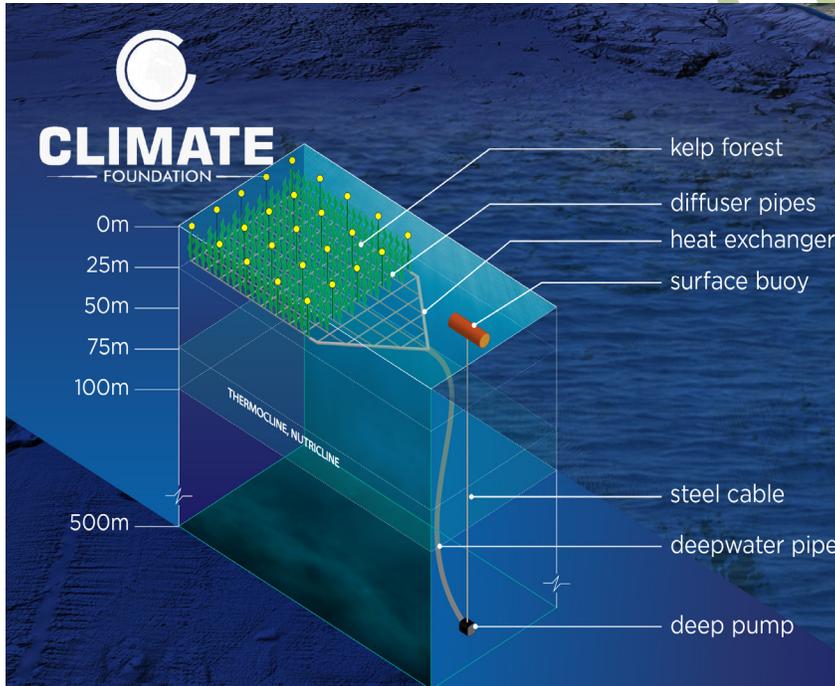
We will replicate our success in West Africa, starting with Equatorial Guinea, then expanding to other countries.

## Outcome

Ultimately, our plan will be to construct networks of CVC-MPs to harvest seaweed using the Marine Permaculture arrays and return the extract to the mainland for processing. The sea kelp extract will then be sold to commercial buyers in offtake agreements and/or processed in-house into nutrient-rich fertilizer.

# DONOR FUND IMPACT

MPs (see below) comprise of semi-submerged, flexible structures located in the open ocean, upon which seaweed grows. Solar energy and wave-driven pumps irrigate the seaweed through a pipe using cooler, deep ocean water from 100-500m. For 100-hectares, we can add >100,000 m3 of water per day, directly irrigating seaweeds.



With your help, we will be able to **raise seaweed farmer revenues by 150%, crop yields by more than 10%**, and much more! Explore impact levels below:

<b>\$1 M</b>	<ul style="list-style-type: none"> <li>• <b>4 communities reached</b></li> <li>• <b>45 families helped</b></li> <li>• <b>225 children helped</b></li> <li>• <b>+45 jobs</b></li> </ul>
<b>\$5 M</b>	<ul style="list-style-type: none"> <li>• <b>15 communities reached</b></li> <li>• <b>610 families helped</b></li> <li>• <b>3,065 children helped</b></li> <li>• <b>+150 jobs</b></li> </ul>
<b>\$10 M</b>	<ul style="list-style-type: none"> <li>• <b>30 communities reached</b></li> <li>• <b>6,150 families helped</b></li> <li>• <b>30,765 children helped</b></li> <li>• <b>+500 jobs</b></li> </ul>

The Team combines deep technical expertise, scientific rigor, on-the-ground implementation experience, and strong ties to the governments in Madagascar and across Africa. The Team includes: **MCDI** (lead partner), a global health organization with over 30 years of experience leading integrated, community-based programs throughout Africa and in Madagascar; including programs combining health and biodiversity; and, The **Climate Foundation**, world leaders in studying and developing carbon balance in soils and seas and mitigating climate disruption in critical ecosystems, and pioneers in developing Marine Permaculture to build value chains harnessing natural ecosystem regeneration, focused on food security, carbon balance, environmental health, and community well-being. Together, we share a commitment to reduce poverty, enhance livelihoods, improve health and nutrition, and support climate and economic resilience in Madagascar and around the world. MCDI, as the lead partner, offers experience leading large, complex initiatives, the largest being the Bioko Island Malaria Elimination Project valued at \$98 million over the past 15 years.