



Enhancement of Coral Reef Restoration Efforts Between Colombia's Corales de Paz and Ecuador's Conservación Marina Ecuador (CONMAR) - Corallium Project

TERMS OF REFERENCE

Background

The year 2020 marked the start of the UN Decade on Ecosystem Restoration, with coral reef restoration as a priority since they are one of the most threatened ecosystems on earth. In some countries however, restoration efforts remain weak due to technical and scientific limitations. It is therefore important, if the degradation of coral reefs worldwide is to be reverted, that countries and organizations that have expertise in effective and large-scale coral reef restoration provide technical and scientific support to their peers that lack it.

In Colombia, the Ministry of Environment and Sustainable Development has shown interest in supporting coral reef restoration in the country's coastal territories. This has been demonstrated with key initiatives such as the large-scale A Million Corals for Colombia project, which has been put forward by the Ministry in alliance with Corales de Paz and other partners, including Conservation International Colombia, environmental authorities and the Colombian National Parks. In the context of the Ministry's nature-based solutions (NBS) strategy, this initiative seeks to strengthen interventions in 13 coral reef areas in the country and initiate the restoration of 200 hectares of coral reefs. As the first national-scale initiative of this sort in the country, synergy between local entities and local stakeholders has been key.

In Ecuador, the Ministry of Environment, Water and Ecological Transition and the Ministry of Tourism adopted a strategy to develop the tourism sector focused on the conservation of the environment. Realizing the importance of protecting coral ecosystems for the future of the marine environment and noting the success of coral restoration activities in neighboring country Colombia, the Ministry of Environment supported a one-year coral restoration pilot project in Ecuador and is now interested in scaling up similar initiatives in other areas of coastal Ecuador, including the Galapagos islands.

Rationale

In the last five years, the Colombian organization Corales de Paz has been conducting science-based and participatory large-scale coral reef restoration efforts that have proven to be effective at increasing live coral cover in the Archipelago of San Andrés, Providencia, and Santa Catalina. Through the organization of restoration training workshops, Corales de Paz has experience transferring knowledge, good practices, and lessons learned to local teams from the Maldives, Kenya, Tanzania, Costa Rica, and Grenada, resulting in projects with a high ecological and social impact.

It is to be noted, however, that coral gardening efforts in Colombia have mainly focused on the Caribbean coast. Although similar initiatives have been implemented in the Pacific coast, these have been small and experimental in nature and have lacked meaningful community involvement.

On the other hand, coral restoration strategies are just being tested in Ecuador for the first time. Ecuador constitutes the southern limit for coral communities in the Eastern Tropical Pacific, resulting



in an urgent need to protect and restore coral ecosystems at this location, where corals have been declining through time due to both anthropogenic and natural events.

The organization Conservación Marina Ecuador (CONMAR), through its project Corallium, has started restoring corals in the Pacific Ocean. Similar to the work carried out by Corales de Paz, the Corallium project engages local coastal communities, by educating local people on coral restoration and conservation, with a view to empowering them over this resource. Local fishermen and tourism operators are also being engaged through the project.

However, as this is the first coral restoration project in Ecuador, CONMAR is still testing different techniques and methodologies with the objective of scaling up restoration efforts in the future. The organization aims to implement techniques and methodologies learned throughout Ecuador's coastal area, including Galapagos and to reach out for strategic alliances.

The present project will allow the exchange of scientific knowledge to greatly enhance coral reef restoration approaches both in Colombia and in Ecuador. CONMAR in Ecuador is interested in learning Corales de Paz's techniques to scale up coral restoration efforts, while Corales de Paz wants to learn from CONMAR's knowledge and experience operating in the Eastern Tropical Pacific in an attempt to further enhance restoration projects in the Colombian Pacific. With the increasing support from the governments of each country to restore their coral reefs, this project has the potential to become a catalyst for many more restoration initiatives.

Goal and Objectives

The goal of this Project is to foster long-term cooperation between Corales de Paz (Colombia), and Conservación Marina Ecuador (CONMAR, Ecuador) through the exchange of scientific knowledge and techniques for improving coral reef restoration processes in both countries.

The immediate objectives to which the small-scale funding contributes are as follows:

- *Objective 1:* To scale up coral reef restoration initiatives in Colombia and Ecuador through the exchange of information and lessons learned, and the adaptation of relevant techniques tested in other geographical areas.
- *Objective 2:* To empower local coastal communities that are in constant and direct contact with and dependent on the coral reef ecosystems to effectively engage in the protection of coral reefs in both countries.

Activities

The activities to be carried out by Corales de Paz, in collaboration with partners and with the support provided under this Agreement are the following:

- *Activity 1: Provide online mentoring training on coral reef restoration:* Corales de Paz will provide remote training to a team of six people (three men and three women) from CONMAR, focusing on key coral reef restoration principles and best practices.
- *Activity 2: Conduct a Conservation Training Camp:* Corales de Paz will organize a two-week in-person knowledge exchange in Providencia Island involving a two-person team from CONMAR (one man and one woman). The training camp will focus on:
 - (a) Reef Check - course in coral monitoring (1 week), including species identification (key indicator species such as corals, fish, invertebrates, and substrate categories); common coral



diseases and other impacts; and underwater survey techniques (i.e., belt transects, point intercept, visual census);

(b) Reef Repair - training in coral gardening techniques (1 week), including key factors for coral reef resilience; building, installing and maintaining coral nurseries; coral mariculture (fragmentation, care, etc.); off-shore micro fragmentation; re-sinking of corals; fixing coral fragments onto the reef; outplanting coral fragments; and monitoring coral reef restoration;

(c) In addition, Corales de Paz will share information and lessons learned from its Meaningful Diving strategy, which allows local community members, fishermen, and tourists to participate in the coral reef restoration process by getting hands-on experience and training on how to monitor and restore corals. Through this initiative, fees paid by divers go towards financially supporting coral reef restoration efforts.

- *Activity 3: Organize a knowledge exchange session with local communities:* CONMAR will conduct a series of in-person workshops, training, and fieldwork over one week for a Colombian delegation of three (two local fishermen – one man and one woman - and a Corales de Paz representative) in Salango, Ecuador, where the *Corallium* restoration project is taking place, to:

(a) Allow Colombian and Ecuadorian fishermen to exchange experiences regarding marine resources conservation, including practices leading to coral degradation and more sustainable alternatives;

(b) Provide the two groups of fishermen with training on the importance of conservation for future fishing generations; and

(c) Provide the team from Colombia with hands-on experience on nursery techniques being used in Ecuador.

- *Activity 4: Write and publish a research paper:* After a four-month follow-up for both projects, both organizations will jointly write and publish a science-led and experience-based research paper comparing different restoration techniques between the Caribbean and the Pacific, and also between the Pacific at different latitudes (Ecuador and Colombia Pacific).

Planned Outputs

The expected outputs are as follows:

- *Output 1:* New skills and know-how on coral reef monitoring and restoration transferred to Colombian and Ecuadorian experts.
- *Output 2:* Proven large-scale coral culture techniques for coral reef restoration documented and adjusted to the Ecuadorian context.
- *Output 3:* Coral restoration techniques that have been tested in in the Pacific coast of Ecuador documented and adjusted to the Colombian context.
- *Output 4:* Published research paper comparing different restoration techniques between the Caribbean and the Pacific, and between the Pacific at different latitudes.



Expected Outcomes

The above outputs are expected to contribute towards the following outcomes:

- *Outcome 1:* Proven large-scale coral culture techniques for coral reef restoration are adjusted and implemented in new areas of the Ecuadorian coast.
- *Outcome 2:* Coral restoration techniques that have been tested in the Pacific coast of Ecuador are adjusted and implemented in the Colombian Pacific coast.
- *Outcome 3:* The *Meaningful Diving* initiative is implemented in Colombia and Ecuador, allowing local coastal community members in both countries to be actively engaged in coral reef monitoring and restoration processes.

Schedule of Activities

Activity	Brief Description	Dates
Activity 1	Provide online mentoring training on coral reef restoration	October 2022
Activity 2	Conduct a Conservation Training Camp	October 2022
Activity 3	Organize a knowledge exchange session with local communities	Jan.-Feb. 2023
Activity 4	Write and publish a research paper	Aug.-Sep. 2023

Management and Coordination

As the lead institution, Corales de Paz is responsible for:

- Acting as the single point of contact for the Secretariat of the CBD regarding the implementation of all activities and obligations under this Agreement.
- Being accountable for the successful implementation of the Project, including all reporting and follow-up tasks.
- Ensuring coordination among Project partners and stakeholders.

Roles and Responsibilities of the Technical and Scientific Cooperation Partners

Cooperation will be carried out along the following lines:

- Corales de Paz (*Colombia*):
 - Provide online mentoring training;
 - Provide training through the Conservation Training Camp program and deliver appropriate certifications;
 - Accompany Colombian fishermen during the one-week in-person training in Ecuador; and
 - Collaborate in the documentation of the coral restoration techniques under discussion and the drafting of a research paper.
- CONMAR (*Ecuador*):
 - Participate in the online mentoring training offered by Corales de Paz;
 - Participate in the Conservation Training Camp program offered by Corales de Paz;



- Organize and implement one week of in-person workshops, training, and fieldwork for Colombian and Ecuadorian fishermen; and
- Collaborate in the documentation of the coral restoration techniques under discussion and the drafting of a research paper.