

# The Ocean Life Foundation Project Rovuma

## “Project Rovuma”

### Emergency relocation and protection of up to 2,500 hectares of corals off the coast of Rovuma, Mozambique

#### Introduction

Mozambique is currently the focus of two of the largest LNG plants ever to be constructed in the world, the first being built by a Total led consortium<sup>1</sup>, the other by an Exxon led consortium<sup>2</sup>. Combined investment in the two projects is in the order of \$40-50 billion over the next five years and LNG is projected to be produced for a minimum of 30 years.

The Ocean Life Foundation (“OLF”) is proposing to relocate an estimated 2,500 hectares of corals that are at immediate risk of being destroyed by this industrial development, at an estimated total cost of USD 48 million over three years. Time is of the essence, as projects for construction have already been awarded.

#### Environmental Impact of Rovuma LNG Development

LNG facilities are large scale industrial complexes similar in size to oil refineries<sup>3</sup>. To reduce total project cost, they are located geographically as close to the gas fields as possible. The chosen site for Exxon and Total’s LNG facilities is in the Rovuma area of Mozambique, a sparsely populated area of northern Mozambique that is also ecologically pristine due to minimal human settlements in the area. Both Exxon and Total have published their respective Environmental Impact Assessments<sup>45</sup> on their respective websites which clearly highlights this.

Northern Mozambique, including the shallow water area offshore the Rovuma LNG project is dotted with islands, islets and barrier reefs which harbour some of the most diverse coral species in the world. *CORDIO (Coastal Oceans Research and Development in the Indian Ocean)* published a study indicating that the Mozambique Channel is home to the second most diverse coral reefs in the world after researchers found over 400 different species of coral in the region, almost equivalent to the numbers recorded in the Great Barrier Reef and the Andaman Islands<sup>6</sup>. Researchers Timothy R. McClanahan and Nyawira A. Muthiga from the Marine Programs of The Wildlife Conservation Society published another study presenting how the reefs of northern Mozambique and the Quirimbas Islands exhibit environmental characteristics that can allow scientists to create a portfolio of examples of climate change adaption<sup>7</sup>. When combining the increased number of coral taxa (a biological group of naturally related organisms) in the deep waters of the south with the thermal stability and lack of extreme temperatures of the sea-surface in the north (which is important for the appearance and persistence

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<sup>1</sup> <https://www.total.com/en/media/news/press-releases/total-closes-acquisition-anadarkos-shareholding-mozambique-Ing>

<sup>2</sup> <https://www.exxonmobil.co.mz/en-MZ/About/Who-we-are/Rovuma-LNG>

<sup>3</sup> [https://en.wikipedia.org/wiki/Liquefied\\_natural\\_gas](https://en.wikipedia.org/wiki/Liquefied_natural_gas)

<sup>4</sup> <https://www.exxonmobil.co.mz/en-MZ/About/Who-we-are/Rovuma-LNG#overview>

<sup>5</sup> <http://www.mzlng.com/pt/Responsabilidade/Gesto-ambiental-e-social/Avaliao-do-Impacto-Ambiental/>

<sup>6</sup> <https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0045013>

<sup>7</sup> <https://esajournals.onlinelibrary.wiley.com/doi/full/10.1002/ecs2.1812>

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of more sensitive species), there's an environmental heterogeneity that allows for the existence and preservation of many species.

The Rovuma LNG project will have a substantial and long term environmental impact which will be specifically detrimental for the coral reefs and marine ecosystem in the immediate vicinity of the LNG plants. Corals are a foundational species because they generate the habitat that other organisms live in. Corals are particularly important to the developing world. Many small coastal and island nations rely on [coral reefs](#) for their food supply and the income they generate through recreation and tourism. The presence of corals also protects shorelines from storms and waves, so if these reefs are eroded or destroyed, that protection declines. Most of the substantial [coral reefs](#) found today are between 5,000 and 10,000 years old, which makes their destruction to make way for an industrial complex that much more devastating.

The total area that is at risk is approximately 38,000 hectares (~94,000 acres, 380 km<sup>2</sup>), with the 5-10 meter water depth where the majority of corals are likely to be at risk approximately 5,000 hectares (~12,300 acres, 50 km<sup>2</sup>) as shown in Figure 2 below. If a general assumption is made that fifty percent of the at-risk-area is covered in coral reefs, that would lead to potentially 2,500 hectares (~6,200 acres, 25 km<sup>2</sup>) of corals being at risk of being lost during the construction phase of the LNG facilities. The immediate impact is caused by the necessary dredging and marine construction of the port and the LNG loading facilities, with longer term impact coming from industrial chemicals contaminating the general offshore area.



Figure 1 - Rovuma area 0-30m water depth



Figure 2 - Rovuma area 5-10m water depth

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## Project Rovuma

### Project X – Relocating the corals to safe locations

To mitigate the impact on the coral species, mass relocation of corals to suitable unspoilt locations in the vicinity will be required. This will be labour intensive and costly and will require the financial support of both Total and Exxon as well as political support from the government. The Ocean Life Foundation is in a unique position to spearhead this venture due to our network of contacts in the oil and gas industry, Mozambique government and NGOs that specialise in coral reef relocation, restoration and protection.

The conceptual project would consist of the following elements:

1. Mapping of the Rovuma area using automated underwater vehicles (“AUV”);
2. Mapping of potential relocation areas to determine total area possible;
3. Building coral nurseries using Electrolytic Reef Restoration (“ERR”) powered by offshore floating solar facilities;
4. Commence relocation of corals that are in the highest risk areas and continue as time and funding permits;
5. Establish a research institute in Rovuma that will continually monitor the corals in the ERR nurseries as part of a larger research project into the longer term benefits of ERR with respect to climate change stresses.

Together with our existing partners [Coralive.org](http://Coralive.org) and [Bluenomads.org](http://Bluenomads.org) we have the expertise to undertake such a project. However, the scale of this project is unprecedented and likely to be a world-first. The primary role of the Ocean Life Foundation is as Project Manager and to lobby Exxon, Total and their joint-venture partners, as well as the government of Mozambique, in order to obtain all the regulatory approvals and the required funding.

Total estimated cost of Project X is in the order of USD 48 million, estimated as follows:

1. USD 18 million - 36 months of planning, surveying and physical removal of corals to target locations – USD 0.5 per month;
2. USD 25 million - 2,500 hectares to be covered with Electrolytic Reef Restoration powered by offshore floating solar panels & batteries – USD 25,000 per hectare;
3. USD 5 million – establishment of a coral research institute at the Rovuma site for ongoing research and monitoring of the relocated corals and monitoring of coral health and marine life in the Rovuma area.

On completion of the project, operating expenses for the Rovuma Coral Research Institute (“RCRI”) are estimated at around USD 2 million per annum.

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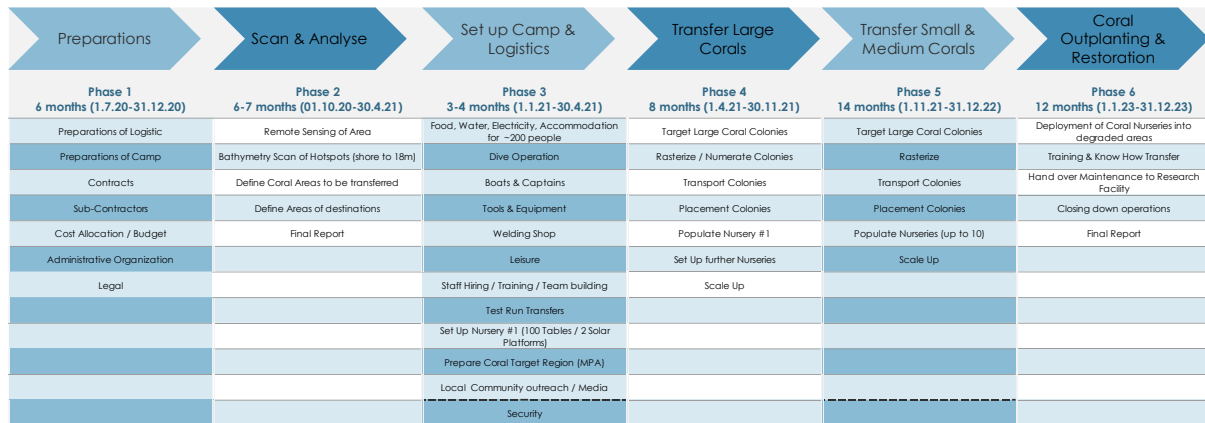


Figure 3 - Project Rovuma Indicative Timeline

## Public Relations and Publicity

It is very likely that Total, Exxon, their joint-venture partners and the government of Mozambique will need to be convinced of the merits of this project, especially in view of the total estimated cost. A key aspect of this project is that it would lend itself to a significant public relations campaign for the Rovuma LNG companies, as it would demonstrate the extensive efforts and costs that they are willing to go to mitigate as much as possible the environmental impact. As highlighted in a White Paper<sup>8</sup>, corals are at imminent risk globally and significant funding will be required to try and protect the remaining corals. The large scale collapse of the eco-system around Rovuma due to the destruction of the corals are likely to have a far reaching socio-economic impact with significantly reduce marine life and fish stocks directly affecting the economic livelihood of the people living in the area.

To that effect, OLF is proposing that the entire project should be the feature of a documentary film that would film all aspects of the LNG development, including the environmental impact of the offshore gas wells, floating facilities and pipelines that will extract the gas to be sent onshore. For this, a research vessel equipped with deep water work class remote operated vehicles or mini submarines similar to that used on the Titanic will be required. Such vessels typically have an operating cost of some USD 50,000-100,000 per day.

<sup>8</sup> Van Hoeken, Vlaswinkel, Milliband et al, *White Paper – Accelerated Restoration and Protection of the Great Barrier Reef by Applying Industrial Scale Combined Micro-Fragmentation and Fusion & Electrolytic Reef Restoration*, 03 December 2019; [https://e7622a22-b228-4bbd-9e3c-48a5dd799e44.filesusr.com/ugd/1618a8\\_dd1c6d9e7142467d90a43481d718e694.pdf](https://e7622a22-b228-4bbd-9e3c-48a5dd799e44.filesusr.com/ugd/1618a8_dd1c6d9e7142467d90a43481d718e694.pdf)