Australian Government
Australian Centre for International Agricultural Research

Fisheries

Restoring damaged coral reefs using mass coral larval reseeding

Overview

Coral reefs are vital marine ecosystems with diverse ecological, economic and cultural values worth billions of dollars to national economies. They are centres of marine biodiversity that supply essential fisheries and other resources and ecosystem services to hundreds of millions of people in tropical coastal communities.

However, they are highly sensitive and in global decline. Almost 95% of coral reefs in South-East Asia are threatened, with the Philippines and Indonesia having the largest areas of threatened reefs globally.

The collapse of healthy reef ecosystems creates significant problems for local communities through loss of essential food and other resources, reduced economic and other values. Reef recovery can take many decades.

However, coral reefs that are damaged and degraded but recoverable (because they are not subject to chronic pollution or other ongoing disturbances) exist in many regions including the Philippines and some parts of Australia. Coral reef restoration can effectively initiate coral reef recovery on degraded reefs in the Philippines.

KEY FACTS

ACIAR Project No. FIS/2014/063
Duration: July 2015 to June 2020 (5 years)
Target areas: Philippines
Budget: A$1,199,851

Project Leader
Professor Peter Harrison, Southern Cross University

Key partners
- Australian National University
- University of the Philippines

ACIAR Research Program Manager
Dr Ann Fleming

Objective

The project's overall aim is to actively restore damaged reef coral communities in the northern Luzon region of the Philippines using mass coral larval reseeding, and to evaluate the socio-economic impacts of reef restoration strategies.

The project's specific objectives are to:

- Increase reproductive success of ecologically important branching and massive corals by optimising fertilisation rates and mass embryo and larval rearing.
- Maximise coral larval settlement in reef reseeding trials and quantify settlement preferences on natural and artificial surfaces for reseeded and cultured corals.
- Increase post-settlement survival and growth of juvenile branching and massive corals in reef reseeding trials and cultures for reef restoration.
- Evaluate the social, environmental and financial impacts of alternative reef restoration strategies.

Expected scientific results

- Increased knowledge of the biology and ecology of coral reproductive processes and the factors that enhance or limit coral reproductive success.
- Improved techniques to maximise the fertilisation and larval rearing, settlement and recruitment processes that underpin coral restoration methods.
- Detailed knowledge of spawning conditions, sperm concentrations, embryo and larval development processes required to maximise reproductive success in a wide range of ecologically important branching and massive corals.
- Increased diversity of corals that can be used for larval reseeding to enhance resilience of restored coral communities.
- Significantly increased rates of coral larval settlement, growth, post-settlement survival and recruitment from large larval reseeding field experiments and coral cultures.
- Improved scientific understanding of the critical early life stages of corals and improved techniques designed to increase post-settlement survival of juvenile corals to enable more rapid recovery of diverse coral communities through reef restoration using mass larval reseeding.

Expected outcomes

- Improved fisheries production, leading to increased food security, employment opportunities and resources for local people.
- Potential for local coral mariculture to increase incomes.
- Improved water quality, coastal protection and other ecosystem services due to improved reef status.

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