



Edited by Peter Symes

# Coral Gardening

*A new profession for resorts?*



Text by Austin Bowden-Kerby, PhD  
Photos courtesy of Counterpart International's Coral Gardens Initiative

**The plight of corals reefs has become regular headlines. Hardly a day goes by without being confronted with ominous news about degradation and loss of coral reefs in some part of the world. On a grand scale, global warming is increasingly subjecting corals to bleaching, while a whole range of other anthropogenic factors are stressing corals on local levels. But it is not all gloom and doom as the Coral Garden Initiative has demonstrated.**

Observing how the villagers and children on Fiji take a keen interest marks a paradigm shift in the ways we see our coral reefs. For centuries, corals were not much more than cheap and abundant raw materials, and reefs were subjected to utilization and destruction for centuries. Corals were harvested for use in construction and landfills or for lime used in production of cement. Reefs were not regarded as being of any particular value and were ravaged by fishing gear,

smashed by anchors, or simply trampled on.

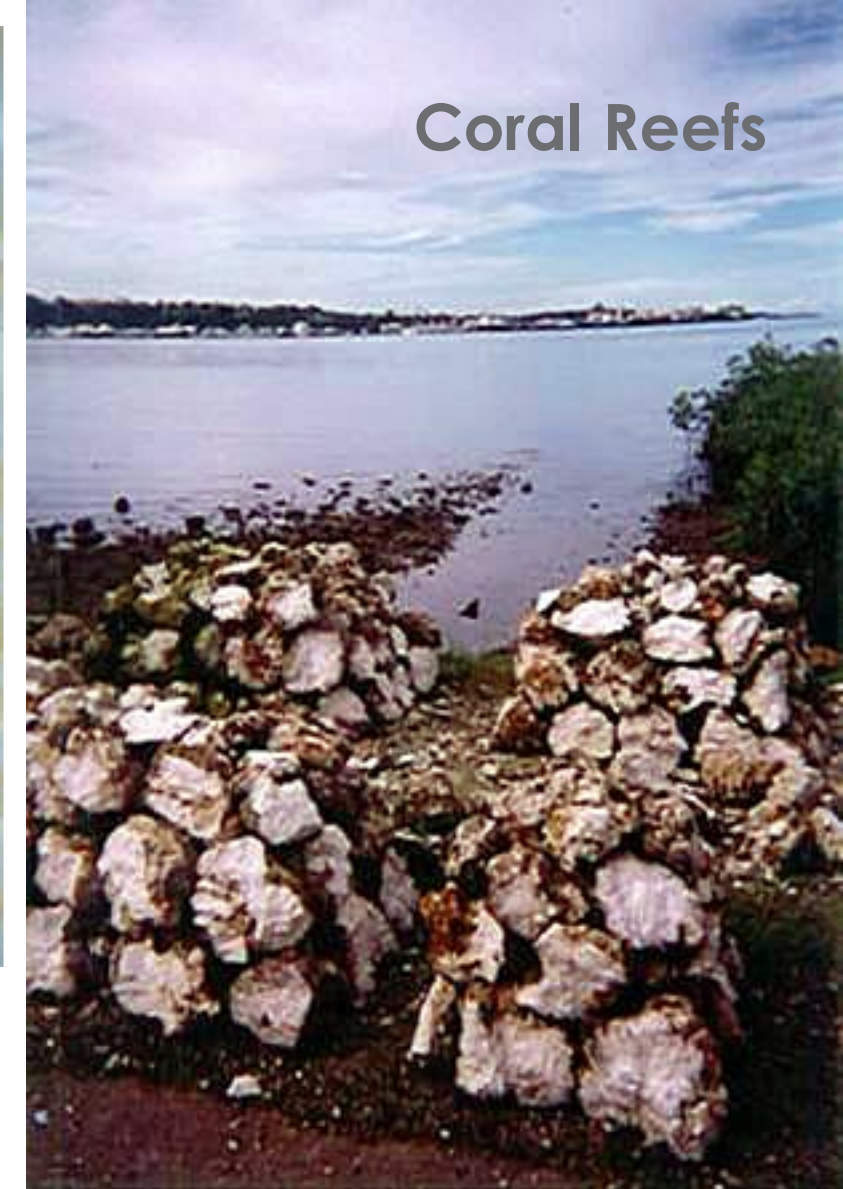
The industrialization of our societies have subjected coral reefs to nutrient enrichment from sewage and agricultural run-off, siltation stemming from deforestation, dredging and agricultural activities. In addition, the widespread overfishing has caused a range of ecological imbalances and changes that have also adversely affected the corals by subjecting them to increased competition (i.e. algae

growth) and predation (i.e. crown-of-thorns infestations). Destructive fishing practices such as dynamite and cyanide fishing, which kills corals in swathes, continue to be a significant problem in certain regions.

*Corals and coral reefs are vital to national and local economies!*

By comparison, harvesting coral for export for the curio and aquarium





trades is a relatively minor problem, but it receives a disproportionate amount of the negative attention and bad press. Why? Because of tourism, which has become one of the most important sectors in terms of economy. And since coral harvesting removes the most colourful juvenile corals from the reef, there is direct and obvious conflict. As coral harvesting is a highly visible activity that takes place in plain sight, it stands out in a manner that is provocative to many whereas many of the more significant chronic causes of reef decline works on a diffuse and, to many, a less observable level, basically because it is out of sight under the surface.

Farmed bleached and painted curio corals could possibly raise funds for conservation

- Coral harvesting is more highly visible than chronic causes of reef decline and touches a nerve with conservationists.

- Coral harvesting sends the wrong message to communities about caring for coral reefs.

In any case, while coral harvesting may not be the most significant threat to reefs worldwide, it generally sends a wrong message about caring for reefs. In this regard, it may be tempting to outright ban all trade in corals as the next logical step, but as so often is the case, in reality, there is no simple answer to complex







Replanting corals destroyed by coral harvesting and dynamite fishing Solomon Islands

Establishment of community-supported Marine Protected Areas on Fiji



problems, and such a step could prove counter-productive.

Banning a trade in corals could deprive poor communities of vital income forcing them to take other and more desperate measures to survive and could ultimately lead to the creation of illicit trade and smuggling that would be much harder to combat. At the opposite end of the supply chain, a ban may also convey a false impression that major progress to combat reef decline has been made. There is a better solution: Cultivation!

**Is banning coral trade helpful?**

Banning the trade may give a false sense that major progress to combat reef

decline is being made. A ban could also make things worse by depriving poor communities of vital income, forcing them into more desperate measures to make ends meet.

Rather than outright banning trade in wild coral, these trades should rather be transformed into sustainable second-generation mariculture enterprises, or commercial coral nurseries, if you like.

These coral farms can ideally be managed by local communities and tied into restoration of coral reefs. This will also allow the indigenous communities to benefit directly from improvements in local biodiversity that follows. As cultivation will replace greenhouse culture overseas, there will also be

an overall reduction in CO<sub>2</sub>-emissions.

**Putting things into perspective**

Crown-of-thorns starfish (COTS), which prey on coral, tend to target the colorful coral species, leaving behind drab Porites and Montipora. As one single Crown-of-thorns starfish can kill one fist-sized coral per day, removing COTS is a far more efficient restoration strategy than replanting corals for many reef systems.

For example, the aquarium trade out of Fiji represents less than 200,000 corals per year, which means that it only takes removing 650 COTS per year to save more corals than banning the trade. The global aquarium trade





# ecology

THIS PAGE: Hands-on activities to accelerate reef recovery including coral predator removal to create pockets of coral health



*The tourism industry is attracted to coral farming and is receptive to hiring trained "coral gardeners". The biggest problem by far is interference by well-meaning scientists who misunderstand the program!*



represents some 2,000,000 corals per year, which is roughly the equivalent to the damage from about 7,000 COTS. By comparison, we removed 5,000 COTS in one year from Cuvu District alone.

Coral farming as a stand-alone activity does not address the root causes of coral and reef decline worldwide but is an important step in the right direction. Coral farming



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- William Tan (underwater photographer; Singapore Symphony Orchestra violinist)
- John "Chip" Scarlett (underwater photographer, launching book 'Loving Sharks' at ADEX)
- Aaron Wong (underwater photographer; Asian Diver & ScubaDiver AustralAsia contributor)
- Richard Ng (underwater photographer; celebrity radio DJ)
- Nadine Chandrawinata (Miss Universe Indonesia 2006; AGS ocean ambassador)

Check the website for more speakers!



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\*The information presented here is correct as of date of print and subject to change.





## Culturing Mother Colonies

## Coral Reefs

SECOND GENERATION CORAL CULTURE



Trimming rates depend on species and mother coral size. A single coral like those pictured above can produce dozens of seed fragments per year

Selection of mother corals for color, skeletal strength, growth form, and survivability



Colonies crowd each other on the table if not trimmed often enough



Trimming rates depend on species and mother coral size. A single coral like those pictured above can produce dozens of seed fragments per year

is also a very powerful way of raising awareness. Fishermen who can barely eke out a living on catching fish can now earn additional income from transplanting coral reefs as well as improving their local habitats. Several projects have been started in Indonesia engaging whole fishing villages in coral cultivation. The same trend has taken a foothold on several Pacific island nations.

As many developing countries

are increasingly dependant on attracting tourism, this is bound to change. By building partnerships for coral reef management, involving fishermen, teachers, youth, and dive shops in the active restoration of corals can give local communities a more sustainable income.

Local communities involved in coral cultivation also tend to show an increased appreciation of the local ecosystems as a whole and also get involved in





At planting

At six months ready for market

At 14 months, some are ready to become second generation mothers



other aspects of restoring reefs such as planting corals on reefs which are not recovering by themselves after extensive coral harvesting or dynamite fishing.

In other instances, as we saw in Honduras, sons of fishermen were building fish houses out of concrete to improve the local habitat. Cultured corals were then transplanted onto these fish houses.

The main objective of the

Corals Planted on Fish Houses For awareness, reef conservation, enhanced guest experience, and community employment!



Hands-on Involvement of the Youth Sons of Fishermen Making Fish Houses, Honduras 2005



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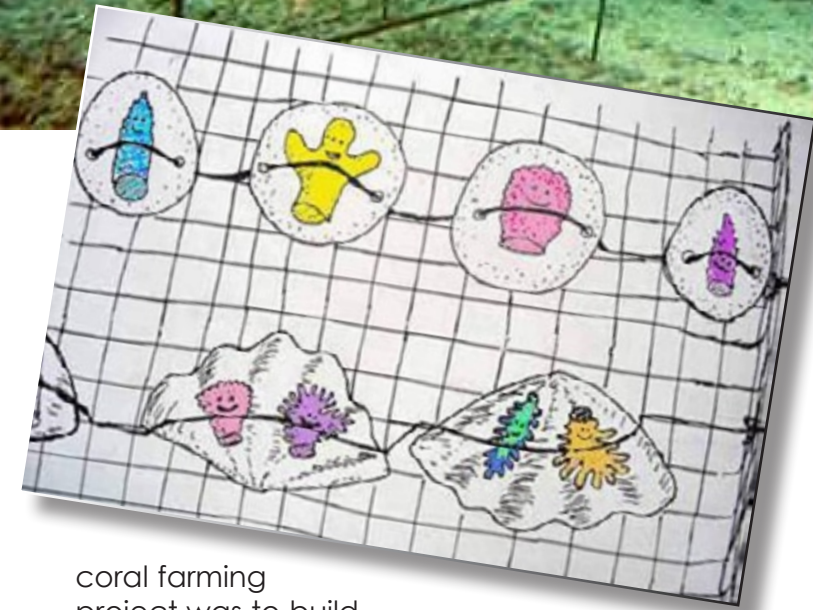




Coral Reefs



Coral Gardeners: A new profession for resorts?



coral farming project was to build partnerships for managing coral reefs by educating local communities and tourism operators and involving fishermen, teachers, youth, and dive shops in the active restoration of Acropora corals.

Coral Cookie Method: Cement disk, monofilament line, woven onto a heavy wire mesh tray



Cookie anyone?







Caribbean staghorn corals like to be planted upright only!



Trays placed directly on rubble



Locating frames on sand prevents most predation

### Location, location

Not all sites work well for coral nurseries or transplants and it important to understand which factors come into play. For example coral may preyed on and placing coral frames or suspending fragments from ropes prevents against most predation. Not only does it place them out of reach

of any crown-of-thorn starfish but also from fireworms. Meanwhile corals are also sensitive to silt and sediment.

### Weeding is required

Regular site maintenance is required in coral farming. Weeding of seaweeds and removal of coral-killing snails and fire worms is critical.

### Lesson learned

While coral farming as a stand-alone activity does not address the root causes of coral and reef decline, it is a very powerful awareness raising activity. In order to set up commercial or restorative coral farming projects, full educational programs are a prerequisite. Coral farming as a sustain-

able livelihood must also be tied to coral reef management and restoration. Corals can be grown relatively easy in some sites, marketable sizes in four to six months for aquarium, nine to 14 months for curios.



## Coral Reefs



Weeding of seaweeds and removal of coral-killing snails and fire worms

Plugging in trimmed second-generation coral fragments into cleaned dead reef rock

### Recommendations for community-based coral farming

- Begin coral farming as part of the wider management planning process to support awareness and restoration.
- Begin with hands-on community involvement in small-scale coral farming experiments at several promising sites.
- Involve the government from the beginning.
- Support second generation culture—mother corals grown to produce sustainable coral seed.
- Don't raise the expectations of communities for commercial production unless and until markets are secured. ■



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