Biorock technology increases coral growth and fish assemblages

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This study investigated Biorock restoration effects on growth rates of the table coral, *Acropora valenciennesi*, and the staghorn coral, *Acroporaformosa*, in Gili Trawangan, Lombok, Indonesia. The first phase had three treatments: electrified, conventionally transplanted, and natural colonies of *A. valenciennesi* as controls. Growth rate of biorock-treated coral colonies was significantly higher than the other two treatments ($\rho<0.05$). Growth rate of Biorock corals averaged 0.31 cm per week, around 7.5 times faster than natural colonies and 4 times faster than conventionally transplanted corals. In the second phase underwater visual censuses (UVC) showed that fish species richness and abundance were significantly higher around Biorock coral structures. Fish abundance inside Biorock coral structures was 6 times higher than that outside. Diversity index, Evenness index and Simpson's dominance index were 2.15, 0.63, and 0.18 respectively. In the third phase, fragments of *A. formosa* were transplanted to electrified reefs at 3 meter, 5 meter, and 8 meter depth. Electrified corals at shallow depth (3 m) grew more rapidly than deeper ones. Both vertical and horizontal growth rates of electrified *A. formosa* were statistically 3 to 4 times higher than naturally growing corals. These findings demonstrate that application of Biorock technology in Indonesian waters has potential for coral reef rehabilitation, particularly in shallow waters. Biorock reef structures may serve as models for future sustainable restoration of coral reef habitat specifically designed to restore fish communities, even in areas where natural reefs have been badly damaged.

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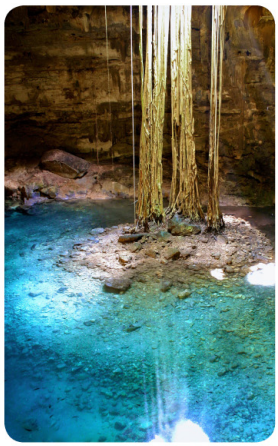


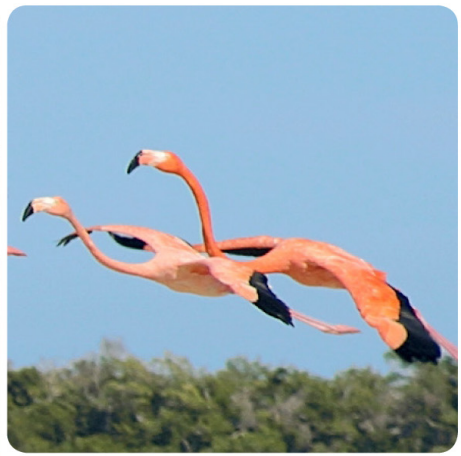

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4th World Conference on Ecological Restoration

20th Annual Meeting of the Society for Ecological Restoration

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Mérida, Yucatán, México

SUNDAY, AUGUST 21 – THURSDAY, AUGUST 25, 2011

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