



Ministry of Marine Affairs and Fisheries
Republic of Indonesia

Indonesia's Current Restoration Policies on Coral Reef Ecosystems

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#2024
KKP BEYOND

#2024KKPBeyond



Introduction



569
species

83
genera

2.5 million
hectares

28.80% of coral
reef coverage
percentage
exceeding 50%.

LPI's monitoring data in 2019

4
endemic
species



Regulation of the President of the Republic Indonesia Number 34 of 2022 on Action Plan of the Indonesian Ocean Policy Year 2021 – 2025

- Program 1.3: Increasing protection for the preservation of marine biodiversity through ecosystem, species, and genetic conservation
- Mandates the Ministry of Marine Affairs and Fisheries (KKP) to conduct coral reef rehabilitation in 20 priority locations.
- Activities: rehabilitation of coral reef in priority location

Regulation of the Minister of Marine Affairs and Fisheries of the Republic of Indonesia Number 26 of 2021 on Pollution Prevention, Damage Prevention, Rehabilitation and Improvement of Fish Resource and The Environment

- Rehabilitation of fish resources and their environment is carried out on coral reefs, mangroves, seagrass, estuaries, lagoons, and bays.



Technical Guidance on Coral Reef Ecosystem Restoration in Marine Protected Area

OUTLINE :

- 1 INTRODUCTION**
Background, Purposes, Target, Scope, and Legal basis
- 2 CORAL AND CORAL REEF BIOECOLOGY**
Coral Bioecology, Growth and Reproduction, Ecological Environment, Current Condition of Coral Reef, and Threats
- 3 CORAL REEF RESTORATION SYSTEM IN MARINE PROTECTED AREA**
Concept, Location Requirement, Method, Funding Analysis, Risk Analysis
- 4 GUIDLINE ON CORAL REEF RESTORATION**
Licensing, Location Determination, Decision Making, Restoration Method Selection
- 5 MAINTENANCE AND MONITORING**
Maintenance, Monitoring on Ecology, Social, and Economy
- 6 LESSON LEARN ON RESTORATION ACTIVITY IN MARINE PROTECTED AREA**
Primary Success and Secondary Success
- 7 RESTORATION SUCCESS ASSESSMENT**
Ecological, Social, and Economy Indicator
- 8 REPORT**



Coral Reef Restoration Methods

Passive Method

Creating environmental conditions that support the natural recovery of coral reefs



Active Method

Active method involve direct intervention to accelerate the recovery of damaged coral reefs



Aim:

- to protect and enhance biodiversity.
- to improve ecological restoration practices, strengthening methods with scientific rigor and evidence-based practices.

Passive Method

Passive restoration includes **reducing physical stress, reducing pollution, reducing water temperature and preserving biodiversity**

Active Method

- 1 Artificial Reef
- 2 Bio reeftech
- 3 Reef Ball
- 4 Biorock
- 5 Rockpile
- 6 MARRS



Success Indicators for Restoration

Indicators for assessing the success of coral reef restoration can be determined based on **coral reef ecosystem services (MEA 2005)**

Provisioning

As a provider of fish resources for community fishing activities

Regulating

Plays an important role in protecting coastal ecosystem

Cultural

As a marine tourism location developed in an area

Supporting

As a habitat for various marine biota, especially protected species in the area

Assessment of the success of coral reef restoration in conservation areas is very dependent on the monitoring activities carried out (**Ecological Indicators and Social Indicators**)

Ecology

- Coral Reef Area
- Live Hard Coral Coverage
- Coral Biodiversity
- Abundance and Biomass of Reef Fish
- Benthic diversity

INDICATOR

Social

- Community livelihood
- Fish catch results
- Public awareness of the importance of conservation area
- Public awareness of the importance of coral reef

The socio-economic conditions of the community in an area will greatly influence the success of programs and activities carried out in marine conservation areas → **providing feedback to the area**



Study on Restoration Compilation

Marine Policy 137 (2022) 104940



Coral reef restoration in Indonesia: A review of policies and projects

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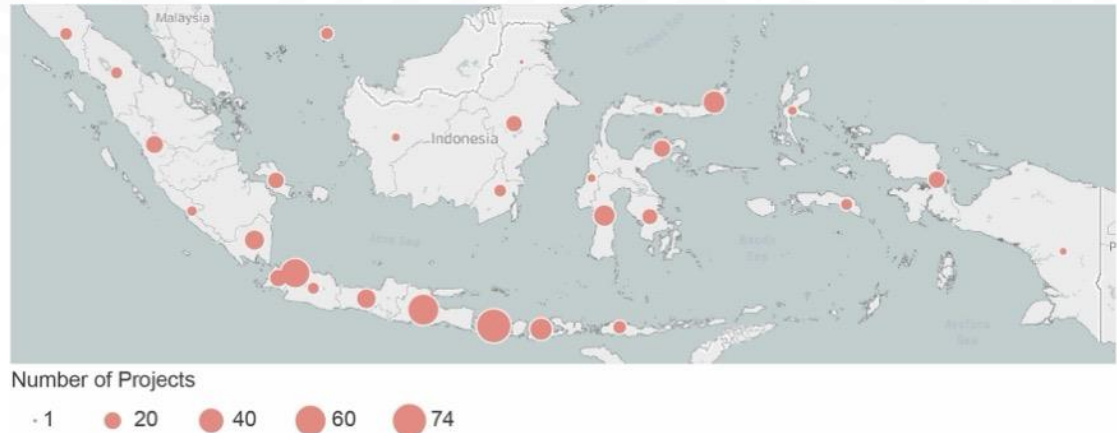
ABSTRACT

Indonesia's coral reefs have been severely damaged by global and local stressors, and a range of active restoration techniques are now being used in attempts to rebuild degraded reefs. However, it is difficult to summarise Indonesia's restoration efforts as a whole due to a lack of consistent reporting. Here, we first discuss Indonesia's legal policy framework concerning reef restoration; this is included in the agenda of two government ministries (Marine Affairs and Fisheries, and Environment and Forestry), and comprises national laws and governmental, presidential and ministerial regulations. We then provide an extensive review of reef restoration projects in Indonesia, documenting 533 records across the country between 1990 and 2020. Most (73%) of these records come from the past ten years, and many (42%) are reported in online news articles rather than scientific reports or papers. This review identified 120,483 units of artificial reef installed across Indonesia, along with 53,640 units of coral transplantation (including both coral nurseries and direct out-planting onto reefs); in total, 965,992 fragments of hard coral have been planted across Indonesia. The most favoured restoration materials are concrete (46%) and steel structures (24%). Projects are organised by a diverse range of governmental, NGO, private and community-led organisations. This review demonstrates that Indonesia's policy has encouraged a diverse range of practitioners to implement reef restoration, but projects are often not coordinated with wider networks of restoration practitioners or scientists, and only 16% of the identified projects included a post-installation monitoring framework. Incorporating clear objectives and long-term monitoring programmes in project planning stages, while prioritising knowledge exchange and engagement with international scientific community, will substantially improve restoration outcomes in Indonesia. This will allow the country to fulfil its considerable potential as a global leader in rebuilding damaged coral reefs.

Indonesia's coral reef restoration projects (1990–2020), aggregated by province. Circles are positioned at the geometric center of each province; their size is proportional to the number of restoration projects in that province. There are a total of 533 projects in the database.

Source: Razak *et al*, 2022 -

<https://doi.org/10.1016/j.marpol.2021.104940>



Examples of Coral Reef Restoration Method:

- A) Rock Piles
- B) Reef Stars
- C) EcoReefs
- D) Reef Balls



Indonesia Coral Reef Garden (ICRG)

Coral Reef Labour Intensive Program



Indonesia Coral Reef Garden (ICRG) is coral reef rehabilitation program which synergies the scientific and Socio-Economic in coral reef restoration for sustainability and utilization through Edu-Eco Tourism or other Economic Creatives.



Launching ICRG, on 7 October 2018 during IMF-WB Annual Meeting in Bali



There are 3 Main Pillars of ICRG :
1. Research and Innovation,
2. Nursery and Transplantation,
3. Community Empowerment and Creative Economy





Indonesia Coral Reef Garden (ICRG)

At Glance



NUMBER OF STRUCTURES

93.685 unit of 8 type of structures



AREA OF RESTORATION

73.4 ha (target 50 Ha - Nusa Dua, Pandawa, Sanur, Serangan dan Buleleng)



NUMBER OF LABOURS

11.039 people
3 non-government organizations (YAKKII, YLKK, and LINI)



PAYMENT METHODS FOR LABOURS

Cashless transfer (10.171 people with their dedicated bank account)





Indonesia Coral Reef Garden (ICRG)

Part of the Program for National Economic Recovery (PEN)

#Program for National Economic Recovery (PEN) is one of a series of activities to reduce COVID-19 impacts on the social economy. Coral Reef restoration is one of the other programs that received the funds.

#The ICRG received the PEN fund of about US\$ 7.9 Million as a response to the reduction of social-economy activities, especially for informal sectors in Bali through conservation efforts.

1. Government Regulation No.23 / Year 2020
2. Government Regulation No.82 / Year 2020





Indonesia Coral Reef Garden (ICRG)

Monitoring and Evaluation



- Five pilot project for the ICRG were facilitated by three NGOs: Yayasan LINI (for Buleleng, North Bali), Yayasan Kebun Koral (for Sanur and Serangan) and Yayasan Asosiasi Koral Kerang dan Ikan Hias Indonesia (for Nusa Dua and Pandawa)
- Biota : Benthic, Briozaa, Sponge and Tunicata



Location Buleleng
(Source: Pokmas
Buleleng
Mei 2021)

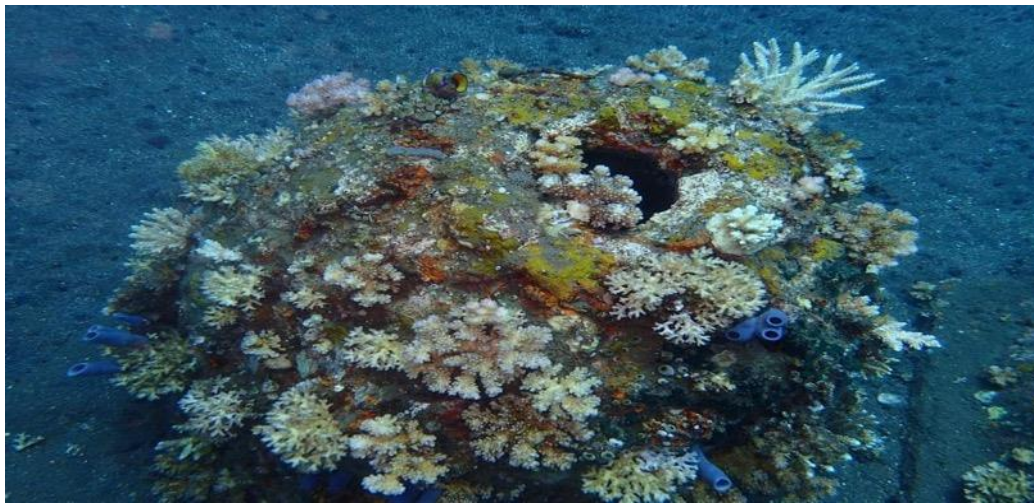
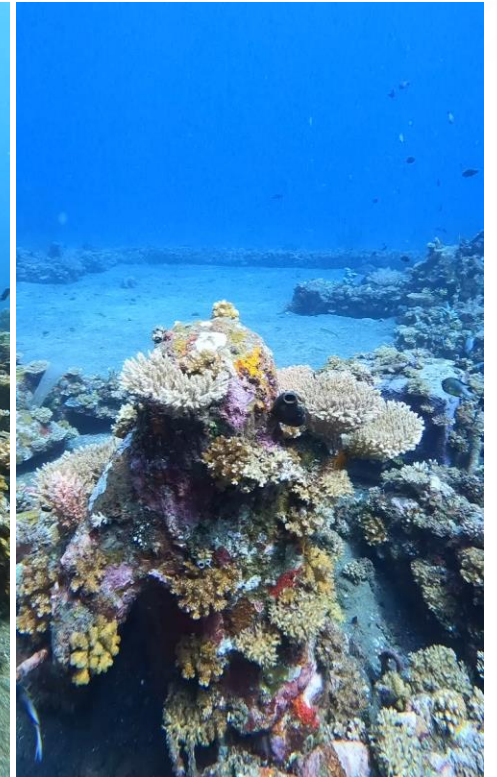
Location Nusa Dua
(Source : survey
program, PES LIPI, Mei
2021)

Locationi Serangan &
Sanur
(Source: YLKK, Mei
2021)



Indonesia Coral Reef Garden (ICRG)

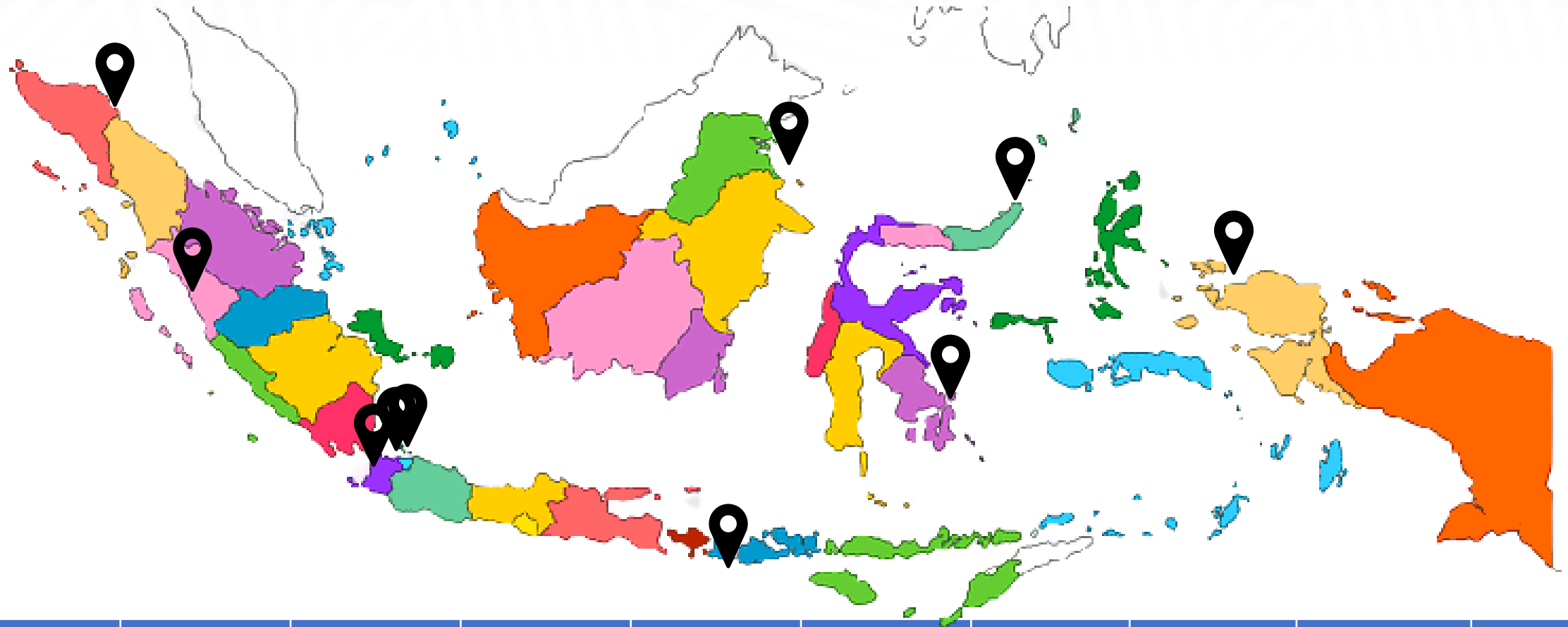
Monitoring and Evaluation





MMAF Coral Stock Center

transplantation, rehabilitation, and conservation activities



1. Pusong Island, South West Aceh	2. Sungai Pinang, West Sumatera	3. Ketapang Beach, Banten	4. Payung Island, Jakarta	5. Lancang Island, Jakarta	6. Maratua Island, East Borneo	7. Elak-Elak Beach, Lombok Barat, West Nusa Tenggara	8. Bokori Island, South East Sulawesi	9. Malalayang Beach, North Sulawesi	10. Malaumkarta, West Papua
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MMAF Coral Stock Center

No	CSC Location	Province	Area (Ha)
1	Pusong Island	South West Aceh	2.65
2	Sungai Pinang	West Sumatera	5.03
3	Ketapang Beach	Banten	0.079
4	Payung Island	Jakarta	0.11
5	Lancang Island	Jakarta	0.18
6	Maratua Island	East Borneo	1
7	Elak-elak Beach	West Nusa Tenggara	1
8	Bokori Island	South East Sulawesi	2.84
9	Malalayang Beach	North Sulawesi	1
10	Malaumkarta	West Papua	5
TOTAL RESTORATION AREA			18.9

The purpose of CSC:

coral reef rehabilitation activities, educational and marine tourism destination

CSC also performs monitoring activities to find out the condition of the transplanted coral, the survival rate (SR) of the transplanted coral, and the rate of coral growth.

1. Growth measurement: the degree of attachment of coral colonies, the increase in the length of the colony, the number of shoots and branching. The dimensions of growth measured are the length and height of the transplanted coral fragments.
2. Death monitoring: collecting (retracting back) corals that have suffered death.
3. Provision of rehabilitation for tourism:
 - a. dive spot location (dive spot),
 - b. provides coral saplings to be adopted in tourist activities in the location of the general use of marine tourist zone.





MMAF Coral Stock Center



Coral Condition on the media MARS Concrete



Coral planting on the media MARS Concrete





Examples of Coral Rehabilitation and CSC

Maluku, Maluku Utara and Papua Barat Daya



Maluku Utara

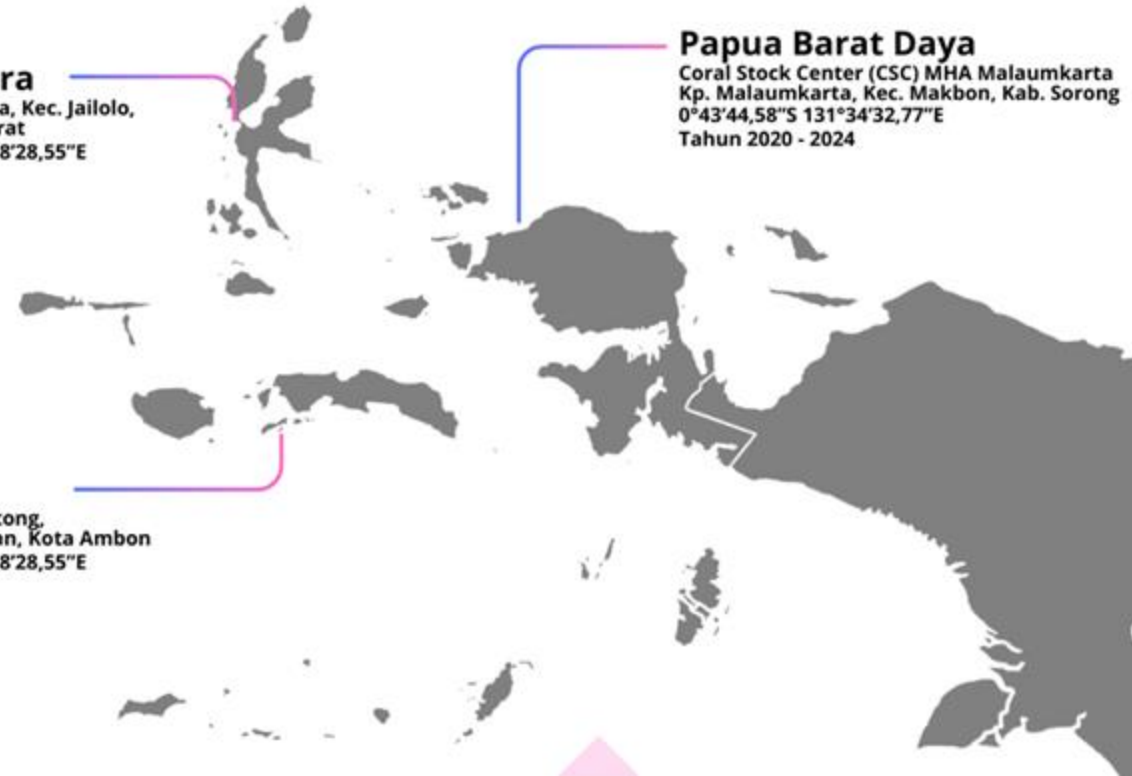
Perairan Ds. Guaeria, Kec. Jailolo,
Kab. Halmahera Barat
01°00'45,70"N 127°28'28,55"E
Tahun 2024

Maluku

Perairan Negeri Rutong,
Kec. Leitimur Selatan, Kota Ambon
01°00'45,70"N 127°28'28,55"E
Tahun 2024

Papua Barat Daya

Coral Stock Center (CSC) MHA Malaumkarta
Kp. Malaumkarta, Kec. Makbon, Kab. Sorong
0°43'44,58"S 131°34'32,77"E
Tahun 2020 - 2024





Examples of Coral Rehabilitation and CSC

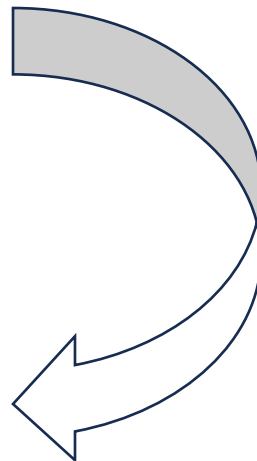
Maluku, Maluku Utara and Papua Barat Daya





Examples of Coral Rehabilitation and CSC

Rope Technique by Kelompok Pencinta Karang Nusa Penida “Nuansa Pulau” at Ped Village, Bali





Examples of Coral Rehabilitation and CSC

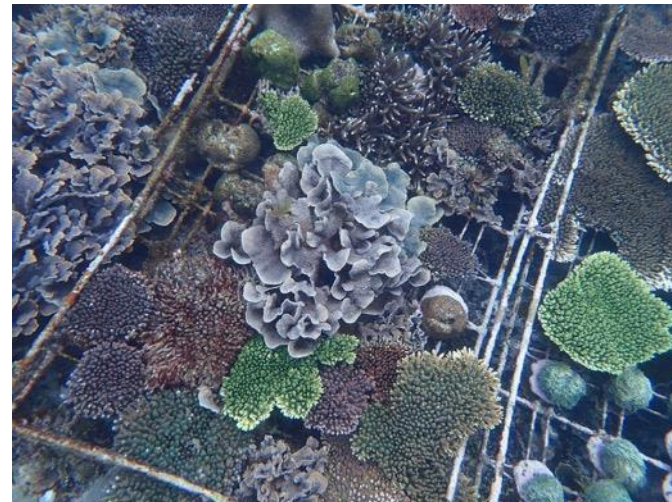
Spiders/Reef Stars Technique by Kelompok Pencinta Karang Nusa Penida
“Nuansa Pulau” at Ped Village, Bali





Examples of Coral Rehabilitation and CSC

Racks Technique by Kelompok Pencinta Karang Nusa Penida “Nuansa Pulau” at Ped Village, Bali





Ministry of Marine Affairs and Fisheries
Republic of Indonesia

**Thank you/
Terima kasih/شكرًا لك**



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KKPPodcast



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