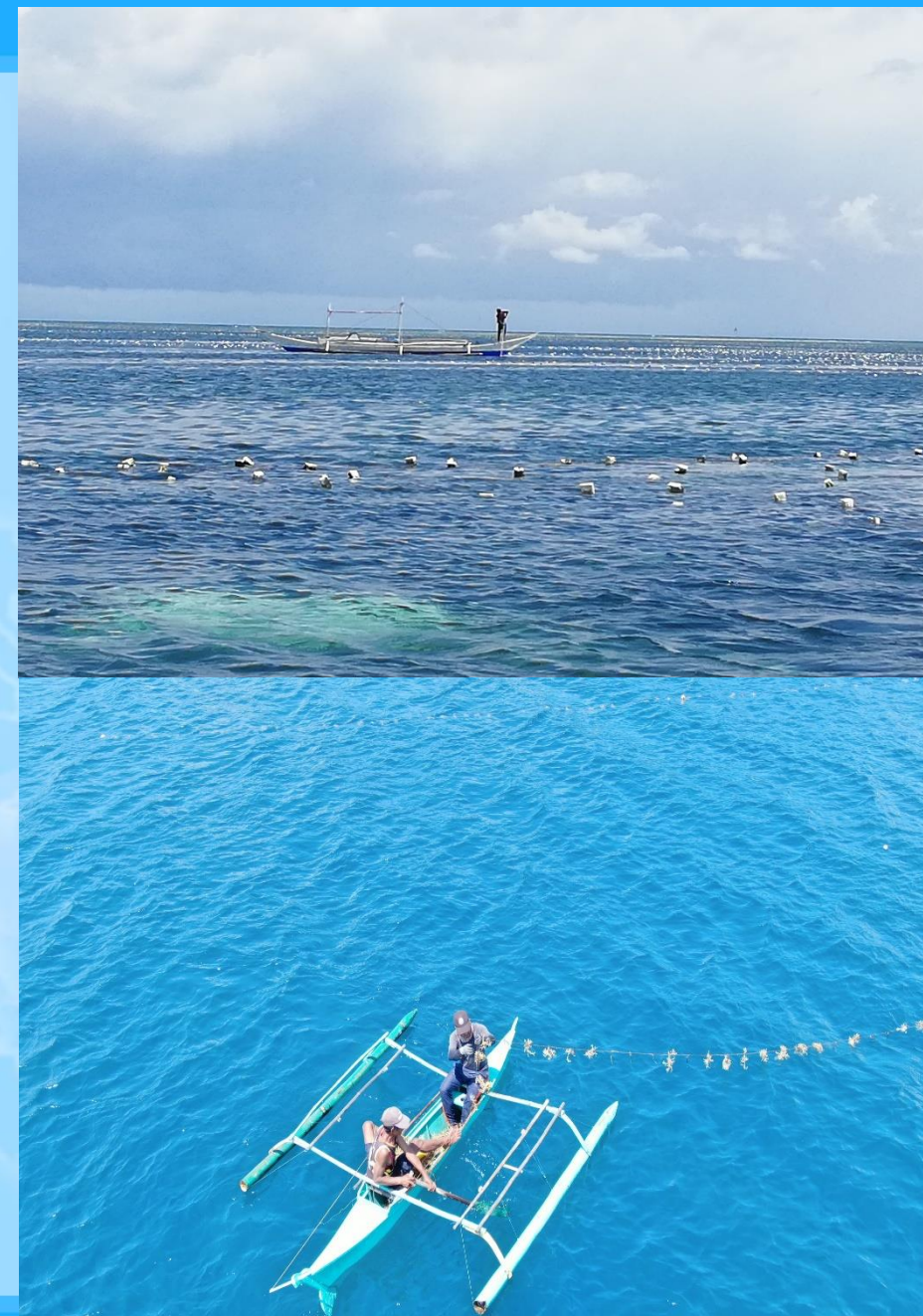




Policies for SEAWEEEDS

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SEAWEEEDS

Plantlike organisms belonging to the algae group

Habitat and food for other marine organisms

Primary producers

For food, cosmetics, medicines, and feeds for aquaculture¹



PHILIPPINE FISHERIES PROFILE 2020



3. Seaweed production, 2020 (in MT)



Region	Production Volume
I	5.49
II	36.07
III	787.07
IV-A	48.15
MIMAROPA	320,717.21
VI	38,929.70
VII	82,597.96
VIII	49,195.08
IX	17,899.56
X	202,606.31
XI	32,188.39
XII	241.81
XIII	9,116.88
BARMM	711,141.33
TOTAL	1,468,653.27

Source: Philippine Statistics Authority retrieved June 04, 2021



BARMM produced 48.42% of the total production of seaweed, making it the top producer of seaweed in the country.

A. Background

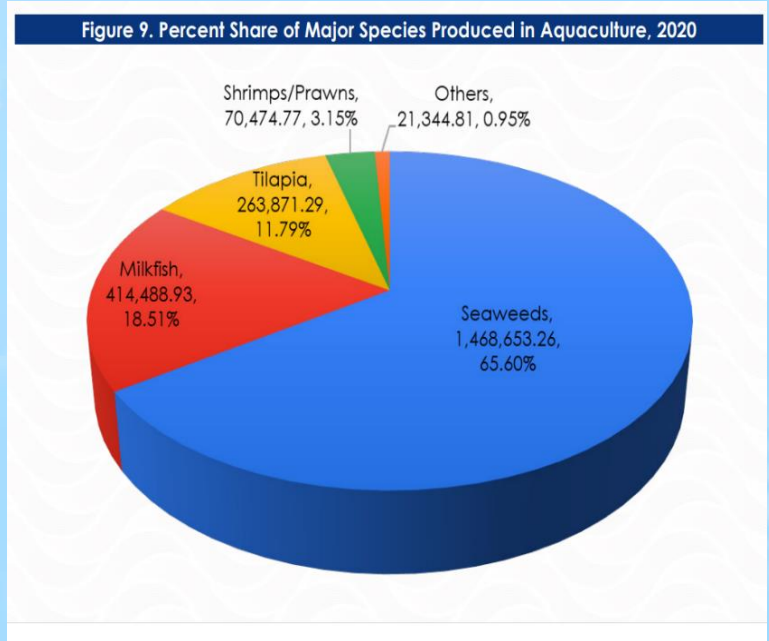
Philippine seaweed production data (2020)

D. Major Species Produced in Aquaculture, 2020

Species	Volume (MT)	Percent (%)
Seaweed	1,468,653.26	65.60
Milkfish	414,488.93	18.51
Tilapia	263,871.29	11.79
Shrimps/Prawns	70,474.77	3.15
Others	21,344.81	0.95
Total	2,211,879.26	100.00

Source: Philippine Statistics Authority retrieved June 07, 2021

Among all the species under the aquaculture sub-sector, seaweed is the main commodity produced in 2020 as it generated a share of 65.60% or equivalent to 1,468,653.26 MT to the total sub-sectoral production. It is followed by milkfish and tilapia with shares of 18.51% and 11.79%, respectively.



2nd in export value in 2019= \$250 million (22%)

PHILIPPINES

Biosecurity Legislations and Policies

Aquatic

Plants (incl. seaweeds)

- Department of Agriculture BFAR “DA-BFAR FAO No. 45”
- DA-BFAR FAO No. 108 and 146
- DA-BFAR FAO No. 169 and 169-I
- PNS/BAFS 208:2017

Animals

- Republic Act (RA) 10654 “Amendment of RA 8550”
- PNS/BAFS 135:2014 “Code of Good Aquaculture Practices”
- PNS/BAFS 112:2016 “Organic Aquaculture”

Terrestrial

Plants

- Presidential Decree 1433 “Plant Quarantine Decree”
- Bureau of Plant Industry Quarantine Administrative Order No.
- Executive Order 292 “Administrative Code of 1987”

Process	Legislation/Policy	Description
1. Farm Preparation	<ul style="list-style-type: none"> ▪ Department of Agriculture – Bureau of Fisheries and Aquatic Resources, Fisheries Administrative Order (DA-BFAR FAO) No. 45 (1956) “Regulations governing and gathering of seaweeds producing agar-agar” ▪ DA-BFAR No. 108(1973) and 146 (1983) “Regulations governing the gathering and farming of seaweeds” 	<ul style="list-style-type: none"> • To regulate the gathering of seaweeds in the wild ▪ To regulate permits for farming eucheumatoid
2. Seedling Outsourcing	<ul style="list-style-type: none"> • Presidential Decree 1433 “Plant Quarantine Law of 1978” • DA-BFAR FAO No. 169-1 (1990) “Prohibiting the exportation of fresh <i>Eucheuma</i> seaweeds” 	<ul style="list-style-type: none"> • Plant Quarantine Decree provided practical measures, to be used to limit the import/export of diseases and pests. • Prohibits exportation of all eucheumatoid seaweed species making it unlawful for any person, association, partnership or corporation to export or cause to be exported from the Philippines • Includes an exception to allow a special permit for government, qualified researchers or staff of educational institutions to export up to 1 kg of fresh eucheumatoid

PHILIPPINES

Title of Policy	Description
<ul style="list-style-type: none">• Philippine National Standard/Bureau of Aquaculture Fisheries Standard 208:2017 <p>Code of Good Aquaculture Practices (GAqP) for Seaweed</p>	<ul style="list-style-type: none">• Provides guidance on practices to prevent or reduce the risk of hazards during farming, harvesting and guidance on site selection, sanitation, management, diseases, harvesting and transport, traceability and record keeping, and aspects on farmers welfare such as personal health, hygiene, and child labor.



POLICY BRIEF

#01, 2021



Towards a Robust and Resilient Seaweed Aquaculture in the Philippines

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Highlights

1. The seaweed carrageenan industry of the Philippines is the top producing national marine commodity with a total value of US\$252M. It generates valuable economic income to more than 200,000 coastal families, uplifting their quality of life.
2. The absence of biosecurity measures in local movements of eucheumatoids exacerbates the transfer of diseases and pests.
3. Loss in biomass has been due to disease and pest outbreaks leading to unavailability of good quality seedlings.
4. Presence of potential wild populations of eucheumatoids in the country, which exhibit a significant genetic diversity, could be used as possible new sources of cultivars for future cultivation.
5. Social inequalities especially in the farm production sector were noted.

- The aim is to highlight the current challenges facing the seaweed industry of the Philippines.
- This study was done by UK Research and Innovation funded by GlobalSeaweedSTAR Project.

Policy Recommendations

The Global Seaweed STAR project implementation in the Philippines brought together national and international experts and community leaders to map risks and discuss solutions for sustainability of the seaweed aquaculture sector. Five key policy recommendations explain what measures can be enhanced to ensure long term sustainable growth of the sector and emphasizes the need to act before risk becomes reality.

1. Promoting conservation of wild populations to preserve genetic diversity. This approach could facilitate a rich source of future sources of new cultivars. From appropriately conserved wild stocks, new seaweed strains that are resistant to IID, exhibit faster growth, or possess other favorable characteristics can be further identified and domesticated. The preservation of the genetic diversity of wild populations can also serve as a source for future initiatives for selective breeding to further improve cultured stocks.

2. Strengthening infrastructure for the consistent supply of robust and biosecured seedlings. A dedicated laboratory for bio-banking, production of new plants through spores and tissue culture techniques must be established, spearheaded by the University of the Philippines Visayas (UPV), Southeast Asian Fisheries Development Center Aquaculture Department (SEAFDEC/AQD), University of the Philippines Marine Science Institute (UP-MSI), in collaboration with the Bureau of Fisheries and Aquatic Resources - National Seaweed Technology and Development Center - National Fisheries Research and Development Institute (BFAR-NSTDC-NFRDI). Further capacity building of staff and upgrading of laboratory facilities throughout the country are also needed. This will enable farmers to have an easy access to good quality, disease and pest-free seaweed cultivars, that are genetically curated within their respective regions.

3. Enhancing Biosecurity Measures. Implementing biosecurity measures, such as screening and proper quarantine of seedlings prior to planting to prevent the transfer of diseased plants to new farming areas. This will require strict monitoring of movement of seaweed between farms by the local government units. Thus, other essential measures are written in the GAQP for Seaweeds, which should be properly disseminated for wider access.

4. Integration of seaweed sector into climate change adaptation planning. Shift of cultivation sites from nearshore (shallow water) to offshore (deeper water) areas, where more moderate and stable environmental conditions are favorable to meet the challenges of climate change effects. Allocation of areas for fallowing through proper zonation, which can be controlled by the local government units. Also, crop rotation will be supported by seedling provision.

5. Steering multi-stakeholders' partnerships. All stakeholder groups should be equally represented in government reports and statistics by requiring government agencies to collect gender disaggregated data (i.e., roles/involvement, experiences and perceptions, needs). The government needs to direct more support towards farmers because they face greater risks in the supply chain. These interventions should include, but are not limited to (a) provision of financial (i.e., credit, loans, insurance) and technical support services (i.e., trainings, capacity-building activities) to enhance stakeholders' capability and confidence in engaging in entrepreneurial activities; (b) increased monitoring for compliance to required standards, providing incentives to those who conform to required standards; and (c) provision of policies for increased market protection, particularly concerning price control, tariffs/quotas, and access to research/educational services.

INDONESIA

Title of Policy	Description
SNI (Standard National Indonesia)	
<ul style="list-style-type: none">• SNI No. 7672/2011	<ul style="list-style-type: none">• Procedure for seaweed seedling. It consists of seedling requirement and health checking standard procedure
<ul style="list-style-type: none">• SNI No. 7579/2010	<ul style="list-style-type: none">• Procedure for grow-out and planting methods for seaweed that consists of several applicable planting methods.
<ul style="list-style-type: none">• SNI No. 2690/2015	<ul style="list-style-type: none">• Post-harvest procedure that consists of several applicable and recommended methods for drying seaweed

MALAYSIA

Title of Policy	Description
<p>Malaysian Aquaculture Farm Certification Scheme (SPLAM)</p>	<ul style="list-style-type: none"> • Policy for managing good aquaculture practices on-farm level, which explicitly includes seaweed aquaculture and was introduced in 2005.
<p>Malaysian Good Agricultural Practices in 2014 (MyGAP)</p>	<ul style="list-style-type: none"> • Aims to gain better recognition for seaweed products, in both domestic and international markets through crop standardization and certification under the Ministry of Agriculture and Food Industries (MAFI)
<p>MS 2467:2012 CODE OF PRACTICE FOR SEAWEED CULTIVATION</p>	<ul style="list-style-type: none"> • Developed as a standard for Eucheumatoid farming practice, that also includes some disease prevention measures such as quarantine disease and pest detection on the seaweed crop, farm management and associated risks for the environment

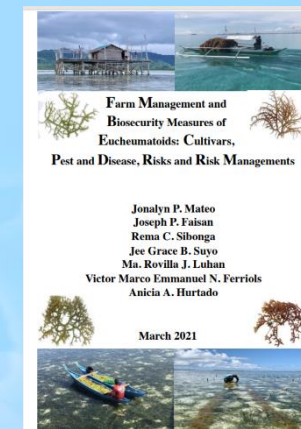
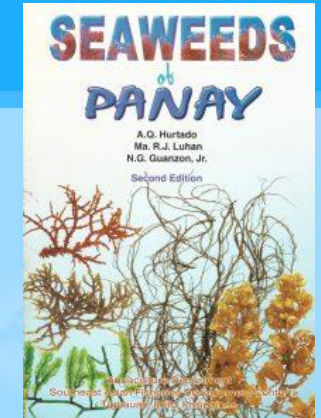
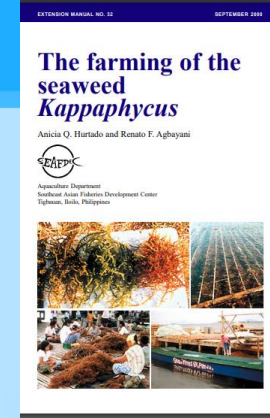


SEAWEEEDS TISSUE CULTURE AT SEAFDEC/AQD



SEAFDEC/AQD Milestones

- 1992** Monograph published documenting surveyed seaweed resources in Panay Island
- 2003** Successful tissue culture of *Eucheuma denticulatum*
- 2006** Improved *Eucheuma denticulatum* strain developed
- 2008** Microplantlets from *Kappaphycus* spp. successfully produced through tissue culture
- 2011** Successful spore-shedding of *Kappaphycus striatus*, successful field-testing
- 2015** Field testing in seaweed farms of tissue-cultured *Kappaphycus* plantlets
- 2016** Pilot tissue culture laboratory established
- 2018** Training of BFAR technical staff on micropropagation and nursery of *Kappaphycus*
- 2019** Production of *Kappaphycus* cultivars through micropropagation
SEAFDEC/AQD named technical adviser in operating BFAR seaweed culture laboratories





SEAWEED TISSUE CULTURE LABORATORY



SEAFDEC/AQD, TIGBAUAN, ILOILO, PHILIPPINES

MICROPROPAGATION/TISSUE CULTURE

- Micropropagation is a sterile culture of seaweeds using explants in a culture medium (Yokoya and Yoneshigue-Valentin, 2011)
- Dawes and Koch (1991) demonstrated the first successful branch tissue culture of *E. denticullatum*
- Luhan and Mateo (2017) established a simple method of producing propagules within a shorter period of time in media using inorganic nitrogen



SEAFDEC/AQD SEAWEED TISSUE CULTURE



Laboratory
Phase
(90d)



Sea-cage
Nursery
Phase
(90d)



Grow-out
Phase

Laboratory Phase



Cut tips from the branch



Disinfect



Cut explants



Stock propagules in a culture vessel (1 month)



Transfer propagules to carboy (1 month)



Transfer propagules to carboy (1 month)



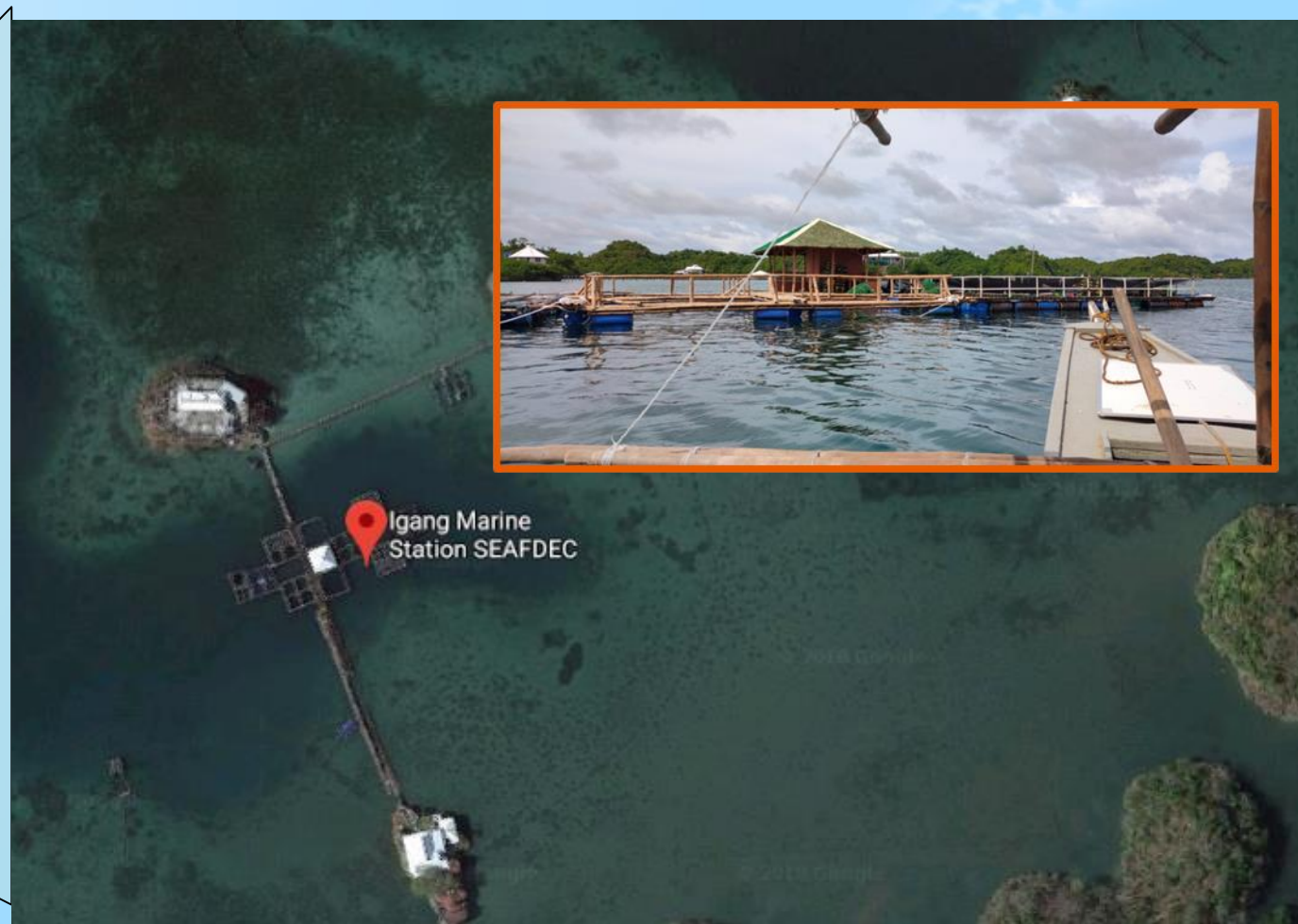
Pack propagules for transport (after 3 months)



Transfer to sea cage (3-month culture)



SEAWEED TISSUE CULTURE SEA CAGE NURSERY



SEAFDEC/AQD, IGANG MARINE STATION, GUIMARAS, PHILIPPINES

SEAWEED TISSUE CULTURE NURSERY

Nursery Phase

1



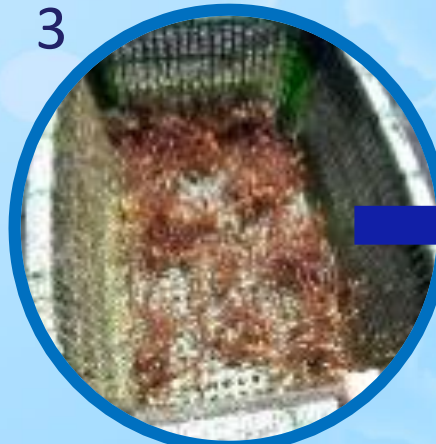
Acclimate propagules upon arrival

2



Transfer propagules to trays and culture for 3 months

3



Plantlets can already be planted to seaweed farm for the grow out

4

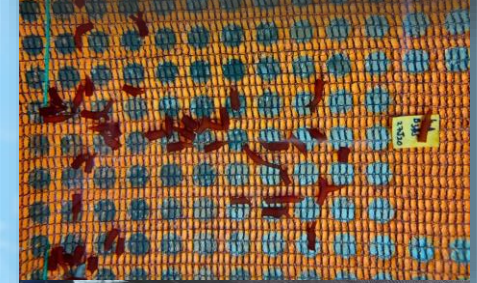
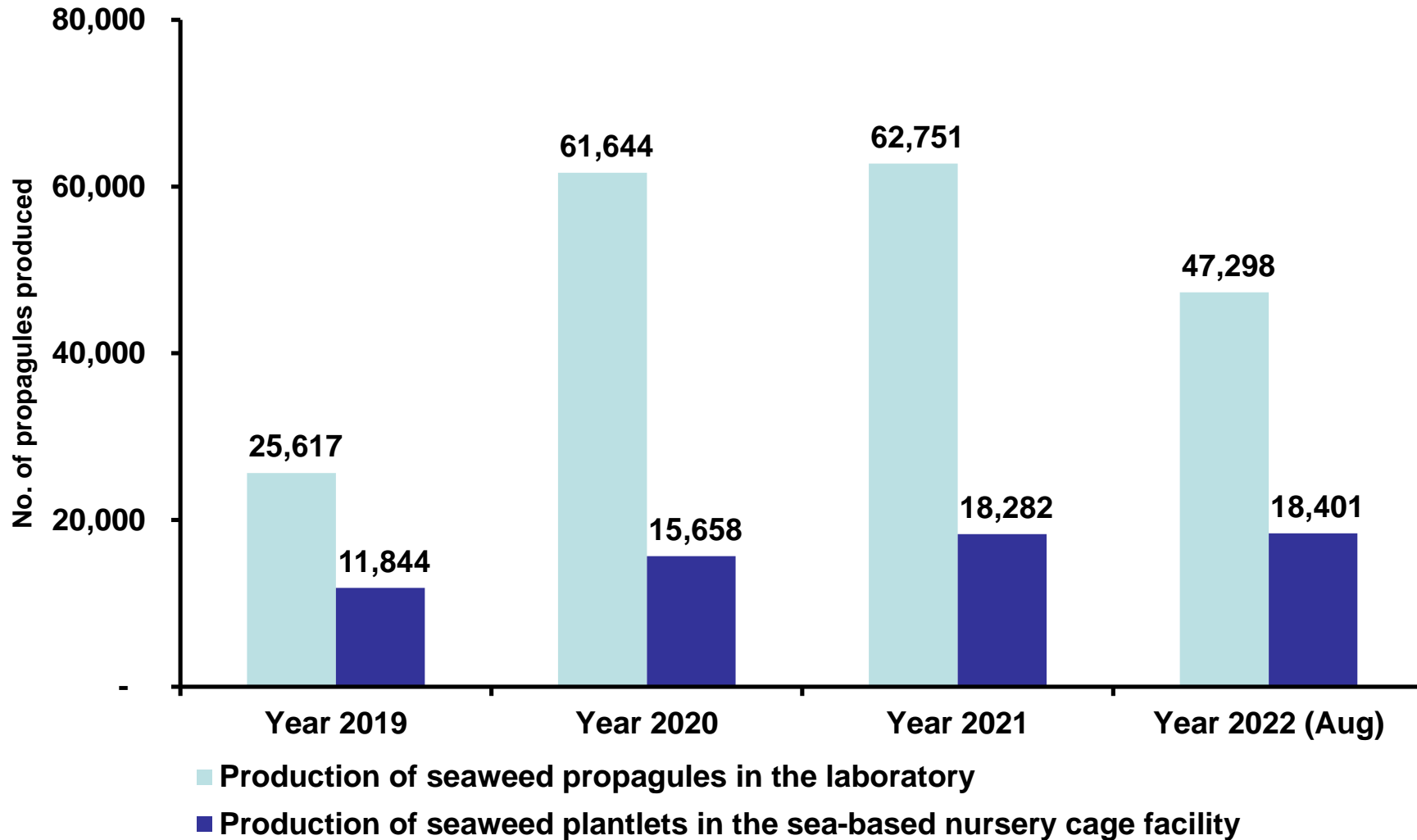


5



Tie plantlets to lines

Production of tissue cultured plantlets at the nursery





Collaborations





SEAFDEC/AQD

Southeast Asian Fisheries Development Center / Aquaculture Department

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- Our Organization ▾
- Research Programs ▾
- Priority Programs ▾
- Technologies ▾
- Services ▾
- Contact Us ▾
- Media Inquiries



COLLAB WITH JAPANESE RESEARCH CENTER KICKS OFF

New research projects between SEAFDEC/AQD and the Japan International Research Center for Agricultural Sciences (JIRCAS) kicked off during a project meeting last 2 August 2022.

MORE NEWS

SEAFDEC DEPARTMENTS

- Secretariat
- Training Department (TD)
- Marine Fisheries Research Department (MFRD)
- Marine Fishery Resources Development and Management Department (MFRDMD)
- Inland Fishery Resources Development and Management Department (IFRDMD)

ANNOUNCEMENTS

- [Job vacancy] Technical assistant needed
- [Job vacancy] Chemist needed
- [Job vacancy] Researchers needed
- FishWorld Reopens



**Thank you for
listening!**