

# **PHILIPPINE NATIONAL STANDARD**

PNS/BAFS 208:2021  
ICS 67.120.30

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## **Seaweeds – Code of Good Aquaculture Practices (GAqP)**



### **BUREAU OF AGRICULTURE AND FISHERIES STANDARDS**

BPI Compound Visayas Avenue, Diliman, Quezon City 1101 Philippines

Trunkline: **(632) 928-8741 to 64 loc. 3301-3319**

E-mail: **info.dabafs@gmail.com**

Website: **www.bafs.da.gov.ph**

## Foreword

In 2018, the Philippine Council for Agriculture and Fisheries (PCAF) - Committee on International Trade (CIT) requested the Bureau of Agriculture and Fisheries Standards (BAFS) to review all seaweed-related standards to address the recent developments under the Aquaculture Stewardship Council (ASC) and the Marine Stewardship Council (MSC) seaweed sustainability standards through PCAF-CIT Resolution No. 5, series of 2018 (Recommending that Department of Agriculture [DA] Develop a Position on the Aquaculture Stewardship Council [ASC] and the Marine Stewardship Council [MSC] Private Seaweed Standard and Recommend the Same to the Senior Official Meeting-Ministers on Agriculture and Forestry [SOM-AMAF] for an ASEAN Position as a Strategy to Defend the Seaweed Industry from Potential Technical Barriers to Trade [TBT] in the Export Market). In response, the BAFS initiated the amendment of Philippine National Standards (PNS) on Seaweeds – Code of Good Aquaculture Practices (PNS/BAFS 208:2017) in order to align with the ASC and MSC seaweed standards and meet current international requirements on food safety, quality, and sustainability.

The Technical Working Group (TWG) which amended the PNS was created through Special Order (SO) No. 1092, series of 2018 (Creation of Technical Committees [TC] and its TWG for the Development of PNS for Agriculture and Fisheries Products, Machinery, Tools, and Equipment), SO No. 442, series of 2020 (Creation of TC and its TWG for the Development of PNS for Agriculture and Fisheries Products, Machinery, and Structures), and SO No. 81, series of 2021 (Creation of TWG for the development of PNS for Agriculture and Fishery Products, Machinery, Tools, and Equipment). The TWG was composed of representatives from government agencies, academe/research institutions, non-government organization, and private sector. The draft PNS underwent a series of consultations and TWG meetings via face-to-face and online platforms before it was finalized and endorsed to the DA Secretary for approval.

This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2.

## 1 Scope

This Code of Good Aquaculture Practices (GAqP) for Seaweed covers practices that aim to prevent or minimize the risk associated with the production and harvesting of seaweed in brackish and marine waters either in land-based or sea-based facilities including the gathering of those washed-ashore and wild stock. This Code covers the minimum compliance requirements in the aspects of production, harvesting, and post-harvesting and in addressing food safety and quality, seaweed health, environmental integrity, and socio-economic welfare.

## 2 Normative References

The following documents are referred to in the text in such a way that some or all of their contents constitute requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

Bureau of Agriculture and Fisheries Standards (BAFS) – Department of Agriculture (DA). (2021). Raw dried seaweeds – Product standard (PNS/BAFS 85:2021). <http://www.bafs.da.gov.ph/databases>

Bureau of Fisheries and Aquatic Resources (BFAR) – DA. (2018). Amendments to Fisheries Administrative (FAO) No. 250, series of 2014 (Regulations on the collection, harvesting, gathering, selling, and exporting of *Sargassum* spp.) (FAO 250-2, series of 2018). <https://www.bfar.da.gov.ph/LAW?fi=446#post>

## 3 Terms and definitions

For the purposes of this document, the following terms and definitions apply:

### 3.1

#### **seaweed**

macroscopic algae belonging to phylum Chlorophyta (green seaweed), Ochrophyta (brown seaweed) and Rhodophyta (red seaweed). It also applies to species both with food and non-food applications

### 3.2

#### **competent authority**

official government agency having jurisdiction (Codex Alimentarius Commission, 2006)

### 3.3

#### **harvesting**

sustainable taking of wild and cultivated seaweeds

### **3.4**

#### **Local Government Unit (LGU)**

territorial and political subdivisions of the Republic of the Philippines which are the provinces, cities, municipalities, and barangays

### **3.6**

#### **production**

activities which shall include among others but not limited to generation of seedlings out of spores and/or tissue culture, nursery operations, grow out facilities, propagation of seedling as in seaweed farms, harvesting and drying, and post-harvest handling

### **3.7**

#### **seaweed farm**

aquaculture production unit (e.g., brackish and marine waters either in land-based or sea-based facilities) usually consisting of culture systems (e.g., on/off bottom, floating, long-line, raft), holding facilities (e.g., tanks, pens, ponds, raceways, cages), structures (e.g., on-site farm shelter, nursery, sorting, drying buildings, storage), service equipment, and seedlings

### **3.8**

#### **seedlings**

young apical portions, robust and disease-free vegetative cuttings derived from existing or newly developed cultivars ready for out-planting to seaweed farms. Robust refers to healthy plant with shiny bright color, smooth surface texture, firm, and flexible branches. Seedlings also include those produced from micropropagation (tissue culture), spores, and gametes

## **4 Site Selection**

### **4.1 Location**

**4.1.1** Seaweed farm should be located in an environmentally suitable area and should comply with the existing environmental regulations issued by the competent authority.

**4.1.2** Seaweed farms should be located in areas declared by the LGU in accordance with their Comprehensive Land Use Plan (CLUP) and Comprehensive Development Plan (CDP), which are developed in coordination with the competent authority. These areas are selected by the operator/seaweed farmer who holds legal right or privileges thereto (e.g. license to operate, business permit from the LGU). Official authorizations (e.g. license to operate, business permit) granted to the operator/seaweed farmer by the LGU indicate among others the farm location through coordinates and effectivity period.

**4.1.3** Water quality (e.g., pH, turbidity, salinity, temperature, and water current) should be considered in site selection prior to farming as determined by the competent authority. The recommended optimal water quality parameters are listed in Annex A (Recommended optimal water quality parameters for seaweed farming)

**4.1.4** Seaweed farms, unless otherwise covered by existing regulations, should be located far from intact coral reefs to avoid competing with the coral's requirement for growth.

## **4.2 Lay-out and design**

**4.2.1** Seaweed farms should be designed to provide control against cross contamination from seaweed natural diseases, emergence of environmental hazards, and damage to existing brackish and marine habitats.

**4.2.2** Seaweed farms should be designed for proper space allocation, for its structures to ensure species segregation, ease of navigation, and adjustment to the current flow and depth.

**4.2.3** Seaweed farm should be designed and constructed with environment friendly materials that will prevent environmental impact and physical damage to seaweed during culture and harvest. If necessary, environmental impact assessment should be done not only in during the time of seaweed farming but also during the off season of farming.

## **5 Facilities and sanitation**

### **5.1 Facilities**

**5.1.1** Solid and/or non-biodegradable materials used particularly in sea-based facilities should be appropriately used and managed and disposed of at the end of their economic life in compliance with existing regulations. The use of "soft tie-tie" should be prohibited in accordance with applicable regulations.

**5.1.2** Regular repairs and maintenance should be undertaken to preserve the good physical condition of the facility.

### **5.2 Sanitation**

**5.2.1** Seaweed farms and its surroundings should be maintained in a clean and hygienic condition.

**5.2.2** Containers, tools, equipment, and other materials used should be always maintained clean and in good condition.

### **5.3 Wastes removal**

**5.3.1** Wastes from seaweed farming and post-harvest activities should be removed, identified as to source (whether onshore or offshore), segregated, and disposed properly in accordance with applicable sanitation regulations.

**5.3.2** Wastes prior to disposal should be properly kept and labeled such that it is not a source of contamination.

**5.3.3** Natural off shore waste like floaters, weeds, discarded or worn out planting implements, and disease infected seaweeds should be properly disposed.

**5.3.4** Waste containers and the waste storage premises should be cleaned after each use.

## **6 Farm management**

Seaweed farmers should avoid the risk of spreading disease and pest infestations within and across farms and conform with existing applicable standards for seedling selection and farming practices. The use of inorganic commercial fertilizer should be avoided in seaweed grow-out farms.

### **6.1 Seedlings**

**6.1.1** Good quality seedlings (specified in 3.6), from registered nursery should be chosen for farming to ensure high productivity and good quality harvest.

**6.1.2** Transboundary movement of seedlings should comply with documentary requirements imposed by competent authority.

### **6.2 Water quality**

**6.2.1** Regular monitoring of water quality as indicated in Annex A (Recommended optimal water quality parameters for seaweed farming) in production sites should be undertaken in coordination with the competent authority.

**6.2.2** Water in the seaweed farm should be far from sources of pollution, run off, and should be in suitable level throughout the cropping period.

## **7 Gathering of washed-ashore and wild stock**

The gathering of washed-ashore and wild stock should be in accordance with the FAO No. 250-2, series of 2018 (Regulations on the Collection, Harvesting, Gathering,

Selling and Exporting of *Sargassum* spp). Gathering of other seaweeds (e.g., *Ulva* spp., *Gelidiella acerosa*, *Gracilaria* spp., and *Caulerpa* spp., among others) from the wild may be permitted as long as it is intended for local consumption, source of future seed stocks, and research, but not for large scale commercial use.

## **7 Diseases**

**7.1** Seaweed farm should follow existing protocol on seaweed disease prevention and management.

**7.2** Incidence of disease infestation in the seaweed farm and nearby localities/sites should be monitored and reported to competent authority, when necessary, for proper remedial measures. Early manifestations of diseases on seaweed should be controlled and eliminated.

**7.3** In the event of imminent massive disease outbreak, the seaweed farming activities should be immediately suspended in the affected areas and infected seaweeds should be disposed properly in accordance with existing regulations. Competent authority should be immediately notified for further corrective measures.

**7.4** Contaminated or disease infected seaweed should be removed, disposed properly, and should not be sold.

## **8 Harvesting and transport**

### **8.1 Harvesting**

**8.1.1** Seaweeds should be harvested between 45-60 days or when its required maturity has been reached. For carrageenan processing, seaweed should be harvested at least after 45 days of cultivation.

**8.1.2** The timing of harvest should coincide with the period of favorable weather pattern and tidal conditions.

**8.1.3** Proper harvesting practices and procedures should be followed.

**8.1.4** Harvested/gathered seaweed should be free from adulteration as defined in Clause 3, foreign and non- biodegradable materials before and after drying process.

### **8.2 Post-harvest handling and transport**

**8.2.1** Post-harvesting structures, equipment, and paraphernalia should be cleaned and kept in sanitary and good operating condition.

**8.2.2** Operations such as washing, draining, drying, sorting, weighing, and packing should be carried out properly and hygienically to maintain the good quality of the product.

**8.2.3** For seaweed intended for drying, proper procedure should be followed to meet existing product standard and preserve its unadulterated condition.

**8.2.4** Seaweed should be transported properly under physical conditions which do not affect the product quality and consumer acceptability. Seaweed for transport should be accompanied by a health certificate, local transport permit, auxiliary invoice, or any applicable regulatory documents issued by the competent authority.

**8.2.5** Post-harvest procedures for raw dried seaweeds should be in compliance with PNS/BAFS 85:2021 (PNS on Raw Dried Seaweeds – Product Standard).

## **9 Traceability and record keeping**

**9.1** Data requirements for the traceability of seaweeds should be in compliance with PNS/BAFS 85:2021 (PNS on Raw Dried Seaweed).

**9.2** All relevant records should be updated, kept, maintained, and made accessible during culture and for at least 24 months after harvesting.

**9.3** Record should be made available to the competent authority when required upon presentation of valid official authorization issued or request.

## **10 Personnel health and hygiene**

**10.1** Any person who would undertake seaweed farming activity should be physically fit to carry out the task.

**10.2** Workers should be trained and required to practice farm level hygienic practices that would ensure their compliance for prevention of seaweed contamination.

**10.3** Personnel who could contaminate products should not be allowed to work and handle the seaweed products.

**10.4** Workers should wear suitable and appropriate working clothes and protective gears.

**10.5** Workers should observe hygienic practices during postharvest work.

## **11 Labor and community**

### **11.1 Child labor**

**11.1.1** Anti-child labor laws, policies, and practices should be observed.

**11.1.2** No child below 15 years of age should be employed, except when they work directly for the family enterprise and under the sole responsibility and guidance of the parents or guardian. Work in the family enterprise should not interfere with child's education and the assigned task does not pose any physical risk.



## **11.2 Person with disabilities (PWD) rights**

No PWD should be denied access to opportunities for suitable employment.

## **11.3 Anti-discrimination/ unequal treatment of employee policy**

Workers in the exercise of their functions/tasks, should not be discriminated based on gender, race, religion, culture, age, etc.

## **11.4 Training on safety and first aid**

**11.4.1** Training on safety procedures should be conducted for the workers.

**11.4.2** First aid kit should be available in adequate quantity and conveniently accessible at the seaweed farm.

**11.4.3** Workers should be able to demonstrate awareness and application of different first aid measures.

## **11.5 Salary, wages and benefits**

**11.5.1** Workers should receive compensation, salary, and benefits consistent with existing labor laws and regulations.

**11.5.2** Working hours should depend on the prevailing and acceptable seaweed farming practices in consonance with existing labor laws and regulations.

## **11.6 Living conditions for employed workers**

**11.6.1** Living quarters in production sites provided to seaweed farmers should be safe, clean, and in good habitable condition.

**11.6.2** Potable water in adequate supply and suitable toilets facilities should be available and properly maintained.

**11.6.3** Toilets should be situated in safe distance from farming/working area.

## **11.7 Social Aspects**

**11.7.1** Farm operations should observe the rights of host local community specially for Indigenous Peoples (IPs) and Indigenous Cultural Communities (ICCs), and LGUs on the use of public land and infrastructures, fishing grounds, and water resources following existing laws and regulations.

**11.7.2** Seaweed farm operators should initiate activities that will foster harmonious, productive and mutually beneficial relationship with local community.

**Annex A  
(Normative)**

**Recommended optimal water quality parameters for seaweed farming**

<b>Species</b>	<b>Salinity (ppt)</b>	<b>Temperature (°C)</b>	<b>pH</b>
<i>Caulerpa</i> spp. <sup>1,2</sup>	≥30	28-31	7.4-9.0
<i>Eucheuma denticulatum</i> <sup>2,3</sup>	27-35	25-30	7.86 to 8.01
<i>Gracilaria</i> spp. <sup>5</sup>	20-28	20-25	8.2-8.7
<i>Kappaphycus</i> spp. <sup>4</sup>	30-31	29-31	-

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2. Juanich, G. L. (1988). Manual on seaweed farming (ASEAN/SF/88/Manual No. 2). <http://www.fao.org/3/AC416E/AC416E00.htm>
3. Melendres, A.R., Jr., & Largo, D. (2021). Integrated culture of *Eucheuma denticulatum*, *Perna viridis*, and *Crassostrea* sp. in Carcar Bay, Cebu, Philippines. <https://www.sciencedirect.com/science/article/pii/S2352513421000995#tbl0015>
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**Department of Agriculture (DA)  
Bureau of Agriculture and Fisheries Standards (BAFS)**

**Technical Working Group (TWG) for the Amendment of Philippine National  
Standard (PNS) on Seaweeds – Code of Good Aquaculture Practices (GAqP)**

**Chairperson**

Alfredo Pedrosa III  
Seaweed Industry Association of the Philippines (SIAP) Inc.

**Vice Chairperson**

Demosthenes Togonon  
Bureau of Fisheries and Aquatic Resources (BFAR)- DA

**Members**

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|   | Philippine Council for Agriculture | 8 | Maria Rovilla Luhan, Ph.D.           |
|   | and Fisheries (PCAF)- DA           |   | Integrated Services for the          |
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|   | Industrial Technology              |   |                                      |
|   | Development Institute -            |   |                                      |
|   | Department of Science and          |   |                                      |
|   | Technology (ITDI - DOST)           |   |                                      |

**BAFS Management Team**

Karen Kristine Roscom  
Camille Baraquiél  
Froline Bernas

**Adviser**

Myer Mula, Ph.D.  
BAFS-DA



## **BUREAU OF AGRICULTURE AND FISHERIES STANDARDS**

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**BPI Compound Visayas Avenue, Diliman, Quezon City 1101 Philippines**

**T/ (632) 928-8741 to 64 loc. 3301-3319**

**E-mail: [bafs@da.gov.ph](mailto:bafs@da.gov.ph)**

**Website: [www.bafs.da.gov.ph](http://www.bafs.da.gov.ph)**