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Status of *Kappaphycus* and *Caulerpa* Farming in Palawan

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Seaweed farming is an established industry in the Philippines. Most of the seaweed produced in the Philippines come from mariculture or farming. The three major producing areas are Regions 4, 9, and the Autonomous Region for Muslim Mindanao (ARMM).

In the Southern Tagalog Region (Region 4), the main farming areas are the provinces of Palawan, Quezon and Batangas. Palawan has the highest production in the region which is about 138,950 mt (Provincial Agriculture Office, PAO 2000), hence, the bulk of seaweed harvest came from the Province. Palawan has a total land area of 14,893.3 square kilometers. Its coastline stretches 2,000 km from north to south and is composed of 23 municipalities and one city. Twenty municipalities are engaged in seaweed farming (PAO 2000).

Farming

In 1978, seaweed farming was introduced in Green Island, Roxas, Palawan by the Marine Colloids, Philippines. In 1979, seaweed farming using the Tawi Tawi technology was adopted in the municipality of Balabac. Being a profitable business, seaweed farming became very popular in the area many "Palawenyos" adopted seaweed farming as their main source of livelihood.

Production areas

In Palawan, the Provincial Technical Working Group on Seaweeds conducted a study on seaweed farming. The municipalities were then classified based on the climatic condition of the area:

Class A (year round) - Agutaya, Cuyo Island (Cuyo and Magsaysay), Cagayancillo, Balabac, and Calamianes Group of Island.

Class B (year round but need to transfer from one area to another) - Dumaran, Roxas and Taytay.

Class C (seasonal planting) - El Nido, San Vicente, Aborlan, Narra, Bataraza, Rizal and Quezon.

Seaweed species

There are several seaweed species found in the province. Among the common species with economic importance are *Eucheuma*, *Caulerpa*, *Gracilaria* and *Sargassum*. These species are collected from the wild. *Kappaphycus alvarezii* and *Eucheuma spinosum* are the major species cultured in marine waters. Some seaweed farmers culture *Caulerpa* sp.

Culture methods

There are basically two culture methods for *Eucheuma* used by farmers. Farmers have tried some modifications of the two methods. In Palawan, four culture methods for seaweed farming are used:

Fixed monoline method - This method requires low investment from farmers. It can be installed easily in shallow portions of the coastal areas. Many farmers adopt this method because of its practicality.

Floating vertical monoline method - This method is done in deep waters using bamboos which are tied together. Floating materials like styrofoam serve as bouys. The end of the lines are arranged in parallel position and tied to support lines at the bottom that are anchored in rocks.

Multiple longline method - This method is used in deep waters at 10 meters and above. The lines are installed in areas with moderate to strong water movement.

For *Caulerpa* sp., the rice planting method is used. The species is planted in rows. The culture of *Caulerpa* is also known as the 'sea garden'. The farming area is surrounded by fences.

Management

In farming seaweeds, it is important to secure good quality seedling. Farmers usually produce their seedlings in nurseries. Sometimes, seaweeds are sourced from nearby nurseries or are provided by government agencies like the Provincial Government or the Bureau of Fisheries and Aquatic Resources (BFAR). Some municipalities in Palawan like Quezon and Coron have established seaweed nurseries. *Eucheuma* seedlings are sold at PHP 5 to 12 /kg.

In farm maintenance, lines are checked regularly. Unhealthy seedlings are replaced in cultured lines. Farmers see if ties-ties are tied up properly. Unwanted grazers are removed from the area. The seaweeds are allowed to grow from 45-60 days after planting. In Palawan, there are about 3-4 cropping periods/year for seaweed farming.

Harvesting

After two months culture period, seaweeds (*Eucheuma*) are harvested by 3 to 4 people. Seaweeds tied lines are harvested and placed in rattan baskets. Each rattan basket can accommodate 25 kg of seaweeds. The seaweeds are brought to the boat and later in platforms for drying.

Health management

Health management in seaweed farms is primarily done with proper site, species selection and farm maintenance.

Areas with low salinity are not recommended for *Eucheuma* culture. Healthy and young seedlings are planted to obtain good growth. Undesirable materials and seedlings which look diseased are removed. When a disease spreads in a farm, complete harvesting of seaweed is immediately done.

Post-harvest management

After harvesting, *Eucheuma* is cleaned by washing and removing foreign materials. Seaweeds are then placed in platforms for drying. Drying is done for 2-3 days under the sun. Seaweeds are usually covered with coconut leaves or sacks. When dried, seaweeds are placed in sacks, weighed, stored in warehouses, and sold to buyers.

Marketing

Seaweed is one of the export winners of the country. There are many seaweed traders/buyers in the country. In the province of Palawan, the common practice is from farmer/producer through traders (local traders/viajeros) to exporter/processors. The marketing of seaweeds is channeled to several buyers before it reaches the processors. The price of dried *Eucheuma* ranges from PhP 20-30/kg while *Caulerpa*, which is sold fresh, is at PhP 70-80/kg.