SEAWEED PRODUCTION

Seaweed is one of the most important aquaculture commodities in the Philippines. Seaweed farmers usually enjoy a good harvest from January to June, which are considered peak months for seaweed farming. The most popular and commercially cultured species is the *Eucheuma cottonii* due to its fast growing characteristics and high market price.

Seaweeds are exported either in raw form (fresh or dried seaweeds) or processed form (carrageenan and kelp powder). The major products derived from the utilization of seaweeds are: agar, algin or sodium alginate, and carrageenan. Carrageenan is a natural gum used as additive, binder, and emulsifier on food, pharmaceutical, beverage, and cosmetic industries.

I. ESTIMATED INVESTMENT COSTS*

Qty.		Description	Cost
1,250	kgs.	Eucheuma seedlings	P18,750.00
1	unit	Dugout banca	6,000.00
1	unit	Stainless steel knife	150.00
5	units	Wooden basket/seedbin	500.00
12	rolls	Nylon rope #10 @ P180/roll	2,160.00
10	rolls	Plastic straw @ P75/roll	750.00
12	pieces	Bamboo poles @ P80/piece	960.00
12	pieces	Anchor bar @ P70/bar	840.00
25	pieces	Empty sacks @ P10/piece	250.00
	Total		**P30,360.00**

*Based on February 2009 prices

II. PROCEDURE

Eucheuma has two types: the cottonii (or *guso*) and the spinosum (or *agar-agar*). Both of them can be exported in dried forms. Of these two, cottonii grows faster and is easier to farm.

1. **Site Selection**
   Choose a body of water where seaweeds are endemic; algae eel grasses and sea animals are abundant. The sea bottom should be of hard sand or rocks with the water moving and holding the seaweed loosely. Water depth should be at 1 or 2 feet at low tide and at least 7 feet at high tide. Depth should be determined so that seaweeds will not be overexposed to sunlight and air during low tide and will be exposed to enough sunlight penetration during high tide. Seawater temperature should be between 27° and 30° Centigrade.

2. **Acquisition of Permit to Farm**
   The proposed area must be surveyed by a geodetic engineer to determine the area's bearings and the exact size intended for the business. After the survey, the applicant should acquire an official application form from the Bureau of Fisheries and Aquatic Resources (BFAR) and prepare all the necessary requirements as provided for by law. Guidelines promulgated by the BFAR must be followed to the fullest to avoid cancellation of the application. It should be noted that the application should be approved first before a permit is issued and before commercial farming commences.

3. **Culture Preparation**
   Prepare the necessary materials and install the needed structures prior to planting. Source out quality seedlings from the vicinity to ensure easy transport to the farm site; seedlings must be protected from direct exposure to sun and rain. Transport container like styrofoam box is recommended although ordinary jute sacks will suffice. Seedlings must be immersed in seawater upon arrival, preferably in the seedling bin. Seaweeds get their food from seawater brought in by water current, so once they are off the water for more than 12 hours and without pouring seawater into them in-between, seedlings will die. If the seedlings are placed in a container with inadequate ventilation, packed with too much pressure or if there is an increase in temperature in the container, seaweed seedlings will die. Seedlings to be planted must be around 100-200 g. each. Choose healthy and strong branches; these are usually found at the center and near tips of a healthy plant. Use a clean, sharp, stainless steel knife for cutting branches to leave a smooth surface.

4. **Preparation of Materials**
   Prepare a measuring stick made of bamboo about 0.64 cm. (1/4 inch thick), 7.6 cm. (3 inches wide) and 20.3 cm. (8 inches) long. Wind the plastic straw 25 times around the stick. Insert a sharp knife and cut the straw at one end. Cut similarly the straw at the other end. Get one strip and tie it tightly around one end of the strips to make a bundle. Split each strip into two and make a tight knot at each tip. One strip is sufficient to tie one cutting (planting material). Tie nylon lines to stakes. After clearing the area, measure the exact dimensions of the farm. Commence posting by using the anchor bar. Position the stakes such that nylon lines will be parallel to the water current. Bamboo poles/wooden posts are driven to the bottom, half a meter between rows. The lines are tied at both ends of the posts parallel to each other and 20-25 cm. from the bottom.

5. **Maintenance**
   Visit the farm regularly. Keep plants clean by removing mud and rough seaweeds. It is essential to remove fish and other sea animals that may feed on the seaweeds. Check and prune the disease-infected portion of the plants.

6. **Harvesting**
   Harvesting may be done by pruning the branches and leaving portions of the plant to grow again or by taking all the plants and replacing them with new cuttings, which is best done before each plant reaches 1 kg. or after 45-60 days. From the harvested plants, the best-looking plants are selected for use as seedlings for the next planting. These may be stored in the seedbed if these cannot be planted immediately. Harvested seaweeds are placed in bamboo baskets in the banca then sold raw at the market or dried for added value.

7. **Drying**
   Seaweeds should be dried immediately after harvest, kept clean, and not allowed to come in contact with fresh water. Solar drying is the most popular and low cost option, taking 2-3 days under ideal conditions. Spread thinly harvested plants on a raised platform or cemented pavement with mesh net, dried coconut fronds, or *sawali*. Overturn the seaweeds regularly to facilitate drying. After drying, prepare the dried seaweeds for washing. Place them in a basket and wash in seawater by stirring and shaking the basket. Spread washed seaweeds on the drying area for about 6-8 hours.

8. **Marketing**
   It is advisable to cultivate seaweeds through contract growing or trader financing to ensure a ready market. Buying and selling usually take place within the seaweed growing area. Seaweeds can also be sold to the nearest wet market.

III. ESTIMATED COSTING AND PRICING

Assumptions for a ¼ Hectare Seaweed Farm:
Initial seedling weight: 200 g.
Final Weight during harvest: 1,200 g.
No. of croppings per year: 6
Current market rate (fresh): P25.00/kg.

Production

Total Harvest (wet weight)	7,500 kgs.
Less: Seedling for next cropping	1,250 kgs.
Wet yield for sale	**6,250 kgs**

Production Costs

Particulars	Cost
Direct	
1,250 kgs. Eucheuma seedlings @ P15.00/kg	P18,750.00
Indirect	
Installation (3 man-days @ P295/day)	885.00
Tying of Seedlings (2 man-days @ P295/day)	590.00
Harvesting (1 man-day @ P295/day)	295.00
Drying (3 man-days @ P295/day)	885.00
Labor (P4,000 for 45 days)	4,000.00
Repair and Maintenance	2,000.00
Contingency (10% of direct costs)	1,875.00
Total	**P29,280.00**

Estimated Income Per Cropping (60 days)

Sales (6,250 kgs. X P25.00/kg)	P156,250.00
Less: Total Cost	29,761.00
Estimated Net Income	**P126,489.00**

Reference: Inland Fisheries and Aquaculture Division, Bureau of Fisheries and Aquatic Resources (BFAR)

IV. REGISTRATION REQUIREMENTS

1. **Business Name Certification**
   Department of Trade and Industry (DTI)
   DTI Provincial Office where the business is located
   Validity: 5 years

2. **Mayor's/Business Permit**
   Municipality/City where the business is located
   Validity: 1 year

3. **Tax Identification Number (TIN)**
   Bureau of Internal Revenue (BIR)
   BIR National Office, Agham Road, Diliman, Quezon City
   Trunkline: (632) 981.7000 / 981.8888
   www.bir.gov.ph

4. **Permit to Farm**
   Bureau of Fisheries and Aquatic Resources (BFAR)
   Provincial BFAR Office
   Validity: 1 year

V. TECHNICAL ASSISTANCE

Inland Fisheries and Aquaculture Division
Bureau of Fisheries and Aquatic Resources
2/F, PCA Bldg., Elliptical Road, Diliman, Quezon City
Tel. No.: (02) 929.3439

BUREAU OF MICRO, SMALL AND MEDIUM ENTERPRISE DEVELOPMENT (BMSMED)
5/F, Trade and Industry Building
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Starting A Business

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