The Codium Industry in Ilocos Sur: An Assessment

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Abstract

This study aimed to make a qualitative and quantitative assessment of the Codium industry in Ilocos Sur. In particular; it attempted to determine the profile of the Codium fishermen, inventory the Codium species, determine the harvest per effort, seasonal abundance and harvest/post-harvest procedure of the resource, and identify the problems of the industry.

Direct observations, actual interviews, and microscopic works were used to gather the data needed in this study. Seventy-seven fishermen from three coastal barangays of Sinait, Ilocos Sur (Sabangan, Paratong, and Katipunan) served as respondents.

Results showed that harvesting of natural stocks of Codium was the primary source of livelihood of the residents of the coastal barangays. Codium stocks begin to appear in September and collection lasts until June. The peak development period occurs during the summer months. Three Codium species, C. *arabicum, C. bartletti, C. edule were present in the area.*

Marketing tops the problems of the industry. Other problems include improper harvest/post harvest practices and lack of alternative source of livelihood during off seasons.

Introduction

Background of the Study

Of the many species of Philippine seaweeds, at least 60 have been reported edible (PCMARD, 1991). The more popular species used as food include the "gulamang dagat" *(Gracilaria* sp.), "gamet" *(Porphyra),* "guso" or "kanot-kanot" *(Eucheuma/Kappaphycus* sp.), "balbalulang" *(Hydroclathrus clathrus),* "lato" or "ar-arusip" *(Caulerpa* sp.), "kulot" (Acanthophora spicifera, *Laurencia* sp, *Hypnea* sp.), and "pocpoclo" *(Codium* sp.).

Codium is a common edible seaweed in the Ilocos coast. It is a green alga which thrives in sandy-rocky areas. In Ilocos Sur, it is found in almost all the coastal barangays. In

Sinait, the northernmost town of the province, this algal species is regularly collected from September to June because of its high biomass.

The present production of this resource is by gathering of natural stocks. Fishermen in motorized boats go early in the morning and harvest the natural stocks for a duration of 4-6 hours. In the above-mentioned municipality, collection of this seaweed from September to June has become the families' chief source of income.

Interviews with the *Codium* fishermen revealed that *Codium* production has been declining due to unregulated harvesting and lack of proper management efforts. Fishermen harvest regularly any amount they want. Harvesting or collection of the resource is done by handpicking or uprooting of the entire thallus. No conservation measures have also been done.

In order to avoid overexploitation of the resource, there should be conservation of natural seaweed beds and proper management measures should be developed. This is clearly specified in the Fisheries Administrative Order (FAO) No. 108, Series of 1973 on the production of economically important seaweeds either through harvesting of natural stocks or through farming.

Before any management scheme can be initiated, studies on the biology, seasonality, and biomass production of the resources are deemed necessary. Furthermore, knowledge on the present status of the fishermen, their harvest and post-harvest practices, and problems related to the industry is important. These data will serve as a more valid basis for the formulation of management scheme.

This study attempted to make a qualitative and quantitative assessment of the *Codium* industry in Ilocos Sur. Inasmuch as no data on *Codium* resource is yet available, the researcher believed that data from this study will serve as baseline information which will be important for proper management of the resource.

Objectives

This research aimed primarily to make an assessment of the *Codium* industry in Ilocos Sur. Specifically, it tried to:

1. Determine the profile of the *Codium* fishermen in terms of: age, civil status, average number of children, educational attainment, average weekly income derived from *Codium* harvest, and other sources of income.
2. Determine the harvest/post-harvest procedure of *Codium*.
3. Inventory the *Codium* species in Ilocos Sur.
4. Determine the harvest per effort and seasonal abundance of the resource.
5. Identify the problems of the industry.

Methodology

This study made use of the descriptive-experimental method of research. Direct observations and actual interviews were used to gather the data needed. A questionnaire was distributed to the fishermen to gather information regarding their personal profile and problems of the industry. Data collectors were employed to monitor the harvest per effort, seasonal abundance, and harvest/post-harvest procedure. *Codium* species were collected, preserved, and stored at the University of Northern Philippines (UNP) Laboratory for taxonomic studies. Identification was done through microscopic studies and classification was made down to the species level using available algal literature.

Results and Discussions

Profile of the *Codium* Fishermen

Codium is regularly harvested in three barangays of Sinait, Ilocos Sur: Sabangan, Paratong, and Katipunan, with 77 fishermen engaged in the industry. The profile of the fishermen is presented in Table 1.

Out of the 77 fishermen, the oldest was *56* years old while the youngest was 13 years of age. Majority of the fishermen belonged to the 16-35 age bracket, 37.66% of whom belonged to the 16-25 age bracket and 33.77% belonged to the 26-35 age bracket. Forty-eight (62.33%) were married, 28 (36.36%) were single, and one (1.30%) was a widower. Among the married fishermen including the widower, 51.02% had 1-3 children; 36.73%, 4-6 children; and 6.12%, 7-9 children. Less than half of them (44.15%) had reached high school, 41.56% had acquired elementary education, 7.79% had attended college schooling, and 2,59% finished vocational courses. Three fishennen (3.89%) did not have any formal education. Their average weekly income from *Codium* collection ranged from P250-2500. Thirty fishermen (38.96%) had an average weekly income of P250-500 while only seven of them (9.09%) had an average weekly income of P2001-2500. Most of them (57.14%) had fishing as their main source of income, while some supplemented their fishing activities with farming (37.56%) and managing a retail store (5.19%).

It can be seen from the results that young and old fishermen were dependent on *Codium* collection as their main source of subsistence. Since most of them had reached only high school and elementary education, fishing was the only available source of livelihood. Furthennore, majority of the fishermen had children to support.

Fishennen who had higher average weekly income were the boat owners **or** operators. Those with lower weekly income were the so-called "tripulantes" who either constituted a team with the boat owners or rented the boats and got their income on a share-basis.

Table 1. Profile of *Codium* fishermen in Ilocos Sur.

CHARACTERISTIC	F n = 77	%
Age		
Below 15	I	1.30
16–25	29	37.66
26– 35	26	33.77
36–45	10	12.98
46– 55	10	12.98
56 & above	I	1.30
Civil Status		
Single	28	36.36
Married	48	62.33
Widower	I	1.30
Number of Children	**n =49**	
None	3	6.12
1–3	25	51.02
4–6	18	36.73
7–9	3	6.12
Educational Attainment		
No fonnal education	3	32
Elementary	34	2
High School	6	3.89
Vocational	41.56	44.15
College (undergraduate)	2.59	7.79
Average Weekly Income		
P250 - 500	30	38.96
501 - 1000	19	24.67
1001–1500	13	16.88
1501–2000	8	10.39
2001 –2500	7	9.09
Source of Livelihood		
Fishing only	44	57.14
Fishing/Farming	29	37.56
Fishing/Retail Store Owner	4	5.19

Harvest/Post-Harvest Procedures

Codium is handpicked from rocky-sandy portions and reef areas, 20-30 feet deep, in the coastal barangays of Sinait, Ilocos Sur. Fishermen (3-4 per team) in motorized bancas with air compressors harvest the natural stocks from 6:00 AM to 12:30 PM (average of 4

rs). The whole seaweed is uprooted from the substrate and placed in sacks. The fresh weeds in sacks are brought to the shore where they are cleaned. First cleaning is done thoroughly rinsing the seaweeds in clean seawater to remove attached stones and dirt. ther cleaning and sorting are done to remove associated species. These are done by all mbers of the fisherman's family.

Packing is done by using bamboo baskets as containers. The inner surface and des of the containers are lined with fresh or dried banana leaves before the clean, fresh aweeds are placed. A topping of fresh or dried banana leaves is placed and exposure to temperature is avoided to maintain the freshness of the seaweed.

The fresh seaweeds are sold in the local markets either directly by the fisherman, wife, or through middlemen. Middlemen sell these fresh seaweeds to other municipalities other provinces. These are sold either by the ganta or by the kilo.

Codium Species in Ilocos Sur

Three species of *Codium* have been observed in Ilocos Sur.

a. *Codium arabbicum* **Kuetzing.** Thallus applanate, deep green in color, irregularly expanding by growth of periphery, with roundish lobes firmly adhering to the substratum by the undersurface, wavy and flexuous on the other side.

b. Codium bartletti Tseng and Gilbert. Thalli deep green, erect, forming extensive mats on coral reefs or rocks. Thalli irregularly to trichotomously branched, branches 1.5-2 mm in diameter, terete or slightly flattened, adhering to each other at some points by cushionlike rhizoidal structures.

c. Codium edule **Silva.** Thalli erect, with decumbent portions, thalli branching dichotomously or subdichotomously; branches cylindrical, 2-4 mm in diameter. Fronds are dark green at middle and light green to almost transparent at the periphery.

All these species have been reported by Trono and Ganzon-Fortes (1988) and Trono (1997). Of the three species observed, only C. *edule* is collected on a commercial scale.

Harvest Per Effort and Seasonality of *Codium*

Table 2 presents the harvest per effort and seasonality of *Codium* in three coastal barangays of Sinait, Ilocos Sur. The harvest per effort are expressed on a daily basis from September 1999 to June 2000, the months when *Codium* was regularly collected in the three areas.

Table 2. Harvest per effort (in **kg) and** seasonality of *Codium* in Sinait, Ilocos **Sur.**

MONTH/YEAR	STATION1 (SABANGAN)	STATION2 PARATONG)	STATION3 (KATIPUNAN)	MEAN
September 1999	14.5	13.8	14.2	14.60
October 1999	25.3	18.2	17.8	20.43
November 1999	29.5	31.2	27.6	29.43
December 1999	35.6	33.4	31.7	33.56
January 2000	39.0	36.7	33.2	36.30
February 2000	48.1	42.3	44.9	45.10
March 2000	54.0	56.2	53.7	54.63
April 2000	65.0	58.9	61.3	61.73
May 2000	58.0	60.7	56.2	58.30
June 2000	28.6	33.5	23.5	28.50

It can be seen on Table 2 that the trend of harvest per effort increased from September 1999 to April 2000. After reaching a peak in April 2000, a decrease in harvest was observed until June 2000. The trend of increase in harvest per effort shows the development and seasonality of *Codium*. The algal species starts to grow in September and tends to bloom until the summer months. Hence, in September the fishermen collect only an average of 14.6 kg per day as compared to the average harvest in April which is 61.73 kg per day. It is during the peak development months that the harvest per effort is high.

No harvests were reported in July and August. The respondent-fishermen reported the disappearance of the resource during these months. The disappearance was observed to coincide with the months when typhoons and monsoon rains occur in the area. Hence, salinity and water movement tend to affect the seasonality of the resource.

From the above data on harvest per effort, the relative abundance of *Codium* from September 1999 to June 2000 collected by the fishermen in the three areas of study is presented in Table 3.

Table 3. Relative abundance of *Codium* collected in Sinait, Ilocos Sur from September 1999 to June 2000.

MONTH/YEAR	RELATIVE ABUNDANCE (IN MT)
September 1999	29.20
October 1999	40.90
November 1999	58.92
December 1999	67.19
January 2000	72.67
February 2000	90.29

Table 3. Continued.

MONTH/YEAR	RELATIVE ABUNDANCE (IN MT)
March2000	109.37
April2000	123.58
May2000	116.72
June2000	57.06
Total	765.92

A great bulk of *Codium* was collected from the area as shown by the total abundance of 765.92 MT. This finding shows **a** very high biomass production of *Codium*. In order, therefore, to maintain the resource, considering that *Codium* is non-farmable or non farming technology has been developed, a management scheme is necessary.

Problems of the *Codium* Industry

Fishermen identified four major problems related to the *Codium* industry:

a. Low price. Fishermen complained of the very low price of their harvests. At times when harvest was scarce, the price was P20.00 per kilogram or an average of P250/can (13 kg). During peaks months, the prices went down to P5.00-P10.00 per kilogram (P75.00-P130.00 per can).
b. Scarcity of buyers. During peaks months, fishermen found difficulty in marketing their harvest. Because of this problem, they were forced to sell their harvests at a very low price.
c. Risk of collection. *Codium* is collected in areas 20-30 ft. deep, with strong water current and high pressure. Divers, aided by air compressors, stay underwater at an average of 4 hours. As an effect of the very high pressure, some fishermen encountered hearing difficulties
d. Lack of alternative source of livelihood. *Codium* fishermen encountered the problems of the industry because of lack of other sources of livelihood.

Conclusions

Codium production comes from the gathering of natural stocks in *Codium* beds. The stocks begin to appear in September and would last until June the next year. Its peak season in its development occurs during the summer months.

Harvesting of natural stocks is the primary source of livelihood of the residents of the coastal barangays of Sinait, Ilocos Sur. Its high abundance in the area makes the resource harvestable on a commercial scale.

Marketing tops the problems of the industry. Other problems include harvest practices and lack of alternative source of livelihood during off seasons.

Recommendations

Sustainability of the *Codium* industry is needed. To attain this, the following recommendations are given:

1. Gathering of natural stocks of *Codium* should be regulated to prevent over-exploitation and loss of the resource. Harvest procedures should be improved.
2. Proper marketing system should be developed. This should involve the fishermen and the local government. A price monitoring system should also be established.
3. Researches on postharvest technology, resource bases, and products of *Codium* are necessary.
4. Other livelihood programs for *Codium* fishermen should be initiated.

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