

Bêche-de-Mer Fishery in the Philippines*

Introduction

Sea cucumbers have long been recognized as a food item and a source of income, especially by inhabitants of the Indo- and South Pacific countries. The harvesting of sea cucumbers for processing into *trepang* (their dried form) was first reported in the Philippines in 1911. They are commonly known by their French name, "bêche-de-mer", synonymous to the old Portuguese name *bicho-do-mar* which means burrowing sea slug. In Tagalog they are called *balatan* and in Visayan, *balat*, *ba-at* or *bat*. Collection and processing of sea cucumbers have been observed and verified in Bolinao, Bani and Alaminos, Pangasinan; San Fernando, La Union; San Vicente, Cagayan; Masinloc, Zambales; Polillo Island, Quezon; Calatagan, Batangas; Cebu; Negros Occidental; Surigao del Norte; South Cotabato; and Tawi-tawi, Sulu.

Sea cucumbers are sold mainly as *trepang*, which is easier to store and handle than the fresh product. They are valued as an exotic delicacy and a flavorful condiment for soup, noodles and other dishes. Some species are prepared as salads and eaten fresh minus the internal organs, in the same way that *Holothuria notabilis* is eaten fresh (usually with vinegar and salt) by itinerant Boholano divers in Batangas. Internal organs of sea cucumbers like

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Stichopus variegatus are also fermented for food.

Bêche-de-mer is also credited with curative powers for ailments like high blood pressure and muscular disorders. Cebu fishermen have been known to use the Cuvierian tubules as a crude plaster for minor wounds.

Economic Importance

Sustained demand for the product from countries like Hong Kong, Japan, China and Singapore has made bêche-de-mer fishery an attractive and lucrative business for many Filipinos. In many islands and coastal villages, income derived from it constitutes a significant portion of a family's livelihood. Especially where the holothurians are abundant in the intertidal zone, women and children are the primary collectors, while men usually go into deeper waters.

A report of the Bureau of Fisheries and Aquatic Resources (BFAR) places total export of dried sea cucumbers for 1984 at 1,189,556 kg valued at P16,364,360

(US\$818,218), with Hong Kong, Singapore and Korea as the top importers. A minimal amount of fresh sea cucumbers was also exported to Malaysia. The 1984 figures represent a five-fold increase compared to the earliest BFAR report of 250,769 kg (worth P2,569,227) in 1977, although the highest values reported were in 1983 (Table 1). Most areas of the country have significant sea cucumber harvests.

Table 1. Summary of sea cucumber exports from 1977-1984 (BFAR Statistics of the Philippines, 1977-1984).

Year	Quantity (kg)	Value (US\$*)
1977	250,769	128,461
1978	616,079	320,714
1979	384,063	244,851
1980	448,078	306,804
1981	613,777	403,139
1982	480,749	428,355
1983	1,222,018	976,472
1984	1,189,556	818,218

*US\$1 = P20 (as of September 1987).

Collection

Most of the time, the local residents of the municipality collect and process the sea cucumbers themselves and then sell them to Chinese buyers. In some instances, vessels that ply the islands for bêche-de-mer hire local divers to collect them in the area and then move on to less exploited areas. Fishermen also gather them especially during the monsoon season or when stormy weather prevents them from going too far offshore for the preferred catch of lobsters and fishes. Since many of the commercial species inhabit the intertidal and upper subtidal areas, the most common method of collection is handpicking at low tide. Other edible invertebrates like molluscs are collected at the same time.

Skindiving, sometimes with the use of a barbed, weighted spear, is also done to gather sea cucumbers from waters 4 to 10



Common setup for smoke-drying sea cucumbers. Photo by M.J.T.-Roa.

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Left: Various species of sea cucumber being sun-dried. Below: Sea cucumbers being smoked. Photos by M.J.T.-Roa.



m deep, depending on the skill of the divers. *Thelenota ananas* and *Holothuria nobilis*, which are now found only in deep waters, are collected by the *hookah* or *kapandra* method wherein divers use a breathing hose attached at the other end to an air compressor (similar to those used for inflating tires) aboard a fishing vessel, usually a motorized banca. Equipped only with wooden goggles, improvised plywood fins and a piece of rock or coral for weights, the divers stay in the bottom for as long as 30 to 60 minutes at a time during which they collect all holothurians within reach. Fish, giant clams, *Trochus*, seaweeds and other edible or commercially valuable products chanced upon are also collected if bag space and time permit.

In Bolinao, Pangasinan, sea cucumbers are also collected during dives primarily intended for catching aquarium fishes. The sea cucumbers are sometimes forced to eviscerate and become bloated before they are brought to the surface. Although the *hookah* method is highly efficient with regard to the number of animals collected at a time, it is extremely dangerous. Death and paralysis of divers have been caused either by the bends or by improper regulation of compressed air.

Processing

Most sea cucumbers are processed into *trepang* prior to being sold to local buyers or exporters. The curing process mainly involves cleaning, boiling and smoke- or sun-drying.

Cleaning involves the removal of the guts and in the case of very calcareous species like *H. scabra*, the scraping of the body wall to remove the chalky epidermis. Relatively small and thin-walled species are degutted by being induced to eviscerate. Big and thick-walled animals like *Actinopyga mauritiana*, *A. miliaris*, *Holothuria nobilis*, *Stichopus variegatus* and *Thelenota ananas* are slit lengthwise on the ventral side and their internal

organs removed. Cleaning is best started soon after collection and while the animals are still alive, otherwise removal of the guts becomes difficult especially for individuals that have not eviscerated prior to death. *S. variegatus* is kept immersed in seawater until it is about to be boiled because it disintegrates with prolonged exposure to air. It is important to thoroughly remove the guts (and the Cuvierian tubules, if these are present) of sea cucumbers, otherwise the dried product is likely to be rejected by the buyers.

After they are cleaned, the animals are boiled in seawater until they achieve a rubbery consistency. Fuel usually consists of mangrove or ipil-ipil wood, coconut husks and driftwood. Boiling time depends on the size of the animal and the thickness of the body wall. As a rule, small and large ones are not boiled together so as not to over- or undercook the body walls.

Drying is accomplished either by smoking or by drying the body walls under the sun, or both. The methods used depend on the thickness and the size of the body wall and the weather. Although some have concrete sheds for smoking and drying *trepang*, the majority use cruder techniques. In Calatagan, Batangas and Bolinao, Pangasinan, for instance, the body walls are simply laid on top of chicken wire suspended over burning coals, protected from the rain by a makeshift shed with a thatched roof.

When the body walls are hard and dry, the *trepang* is then laid out under the sun. This process is extremely important especially if the *trepang* is intended for export. Improperly dried *trepang* is said to be easily attacked by molds and fungi during storage and transit.

Alum is sometimes added to the seawater used for cooking the body walls. Slow cooking with alum is said to prevent the growth of molds or fungi even if the *trepang* is stored up to a month before shipping. Alum also shortens boiling time and hence minimizes shrinkage. Since products are priced according to size (small, medium, large), this is very advantageous to the exporters.

Pricing/Grading of Trepang

Trepang is categorized by gatherers, driers and buyers according to size and species. Each species has its own local or trade name with corresponding prices (Table 2). For all areas surveyed, the highest-priced species are *Holothuria nobilis*, *Thelenota ananas*, *Stichopus variegatus* and *Actinopyga mauritiana*. For the same species, the bigger the animal, the higher is its value.

Fresh (wet) animals are bought from local pickers and paid for per piece. The wet weight prices vary for each locality but generally range from P0.50 to P1.50 for species like *H. scabra*, *H. atra*, *S. chloronotus* and other less preferred varieties, to as much as P7.00 to P15.00 per piece for *H. nobilis*, *T. ananas* and *A. mauritiana*. Animals of preferred species longer than 15 cm command a higher price. The middle price range is P3.00 to P5.00 per piece for *A. echinites* and *A. miliaris*.

The *trepang* is then brought to Chinese traders who grade the products according to kind and size. *Trepang* is purchased from local brokers usually by the kilo, the prices fluctuating from P3.00 to P160.00/kg, depending on the size and species (Table 2). Sometimes products are exported directly to Hong Kong.

Depletion of the Resource

The extent of depletion of the resource is difficult to ascertain as there have been no baseline surveys, only some interviews with gatherers. Even the gatherers admit that compared to previous years, the sizes and the kinds harvested have become increasingly small and less varied, especially in the intertidal areas. They now have to go farther and deeper for the desired species, and still not get the same volumes as before.

Most areas identified as collection areas were found to be virtually stripped of holothuroids, sometimes even of the traditionally non-commercial species.

Table 2. 1986 prices of dried sea cucumber (*trepang*).

Species	Common name	Sizes (cm)	Pieces/kg	Price/kg (US\$*)
<i>Actinopyga lecanora</i> or <i>A. miliaris</i>	khaki	8.9	15-25	1.90
		7.6-8.9	40-50	1.50
		6.4-7.6	80-100	1.00
		5.5-6.4	120-200	0.65
		2.5-5.1	250-300	0.40
<i>A. echinites</i>	brown beauty	3 up		0.65
<i>Holothuria atra</i>	black beauty	10.2	40-50	1.10
		7.6-10.2	80-100	0.70
		5.1-7.6	120-150	0.40
<i>Holothuria fuscogilva</i>	patola	10.2		0.38
<i>H. scabra</i>	patos	15.2		0.70
		dalamogon (giant)	15.2	
<i>Bohadschia argus</i>	leopard	10.2		0.55
<i>St. chloronotus</i>	cuatro cantos	10.2		1.75
<i>St. variegatus</i>	hanginan/gadul	10.2		2.10
		7.6-10.2		1.80
		6.4-7.6		1.40
		5.1-6.4		0.50
		8.9	20	3.75
<i>Actinopyga</i> sp.	buli-buli	7.6	30	3.25
		6.4-7.6	50	2.50
		5.1-6.4	80-100	1.75
		2.5-5.1		0.90
		15.2		4.50
<i>Thelenota ananas</i>	tinikan (prickly fish)	12.7-15.2		4.00
		10.2-12.7		3.50
		10.2		0.55
<i>Holothuria pulla</i>	lawayan-mataba -payat	6.4		0.15
		L	5-7	6.00
<i>A. mauritiana</i>	bacungan (surf redfish)	M	8-10	4.50
		S	12-15	3.25
		XL	3-4	8.00
<i>Holothuria nobilis</i>	susuan (black teatfish)	L	5-7	7.00
		M	8-10	5.00
		S	12-15	3.50
		XS	20-25	2.50
		10-14		8.00
<i>Holothuria nobilis</i>	putian (white teatfish)	M	20-30	5.00
		S	40-60	3.00
		XS	80-120	1.75
		10.2		4.00
		7.6-10.2		3.50

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In other areas, only the very small individuals of the shallow water species were left behind. Such impoverishment is due primarily to uncontrolled, nonselective harvesting. When an area is being exploited for sea cucumbers for the first time, the gatherers tend to select the highly priced species. As collection continues, the catch includes increasingly smaller individuals and lower-priced varieties. In some areas like Cebu, Pangasinan, Batangas and Cagayan, some dried samples obtained were as small as 4 to 5 cm.

Gatherers interviewed have expressed the desire for regulating collection, especially now that they are feeling the ill effects of unlimited harvesting. However, they sometimes rationalize that if sea cucumbers of certain sizes are left to grow, the next gatherer who comes along is bound to harvest them anyway since they will be the only ones left behind.*

Thus, if this fishery is to survive, there is obviously a need for appropriate and realistic guidelines to regulate it. At present, the most practicable method appears to be the regulation of sizes of dried sea cucumber allowed for export since this will be the easiest to monitor, considering the thousands of kilometers of coastline involved. In addition, existing stocks in unexploited and exploited areas should be monitored for effective management of the resource. Finally, artificial propagation of the commercial species as has been done for *Stichopus japonicus* can be undertaken not only to provide seeds for mariculture but also to restock depleted reefs. ●

*"If I don't someone else will" see p. 13.

Lore of the Sea

Pongase

