

**THE PHILIPPINE SHELL INDUSTRY WITH SPECIAL
FOCUS ON MACTAN, CEBU**

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List of Acronyms and Abbreviations

BAS	Bureau of Agricultural Statistics
BFAR	Bureau of Fisheries and Aquatic Resources
CITES	Convention on International Trade in Endangered Species of Wild Flora and Fauna
CPO	Cebu Provincial Office
CRMP	Coastal Resource Management Project
DA	Department of Agriculture
DENR	Department of Environment and Natural Resources
DILG	Department of the Interior and Local Government
DTI	Department of Trade and Industry
FA	Fashion Accessories
FAO	Fisheries Administrative Order
FARMC	Fisheries and Aquatic Resource Management Council
FAME	Fashion Accessories Manufacturers and Exporters
ICLARM	International Center for Living Aquatic Resources Management
LGU	Local Government Unit
kg	Kilogram
MOP	Mother-of-Pearl
NACIDA	National Cottage Industry Development Authority
NGO	Non-government Organization
PhP	Philippine Peso
RA	Republic Act
SUML	Silliman University Marine Laboratory
t	ton
TESDA	Technical Education and Skills Development Authority
USC	University of San Carlos
UP-MSI	University of the Philippines-Marine Science Institute
USAID	United States Agency for International Development
\$	US dollar
Exchange rate: P50 = US\$1.	

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Preface

On the whole, the Philippine Shell Industry is a very overlooked industry. There is little literature or information about the shell industry in the country. This study was therefore done to fill this information gap. It has collated documents and primary data through interviews and survey questionnaires.

This report attempts to document the history of the Philippine shell industry. It also describes Mactan, Cebu, which is the center of the shell trade in the country. Specifically, this report aims to achieve the following:

- Consolidate current data and interviews into a summary of the current reality of the Philippine Shell Industry based in Mactan, Cebu.
- Identify some issues, problems, and perceptions of shell stakeholders concerning the industry.
- Look at the current status of the industry and identify key areas where work with stakeholders may begin toward sustainable management.

The trend of the demand and supply of some key shell species are also described in this report. Information on the exact number of species and volume exported from Mactan, Cebu are limited to some extent considering the tremendous number of species involved in the shell trade. The history of legal initiatives in the Philippines is also discussed.

An annotated outline on the published reports on Philippine mollusks is provided in the Appendix. Fisheries Administrative Orders (FAOs) and the key responses of major exporters are also included in the Appendix.

INTRODUCTION

The Philippines is very rich in sandy beaches, shallow waters, deep seas, coral reefs, rocks and boulders that harbor several thousand species of sea shells (Anonuevo and Zaragoza 1986). A conservative estimate of 5,000 species of mollusks are found in the Philippines, which probably represents the highest diversity of mollusks in any one country; and some 1,500 of these species are involved in the shell trade (Springsteen and Leobrera 1986). This remarkable diversity of mollusks could be largely due to the vast number and complexity of habitats available among the 7,100 islands, which could lead to the isolation of organisms and subsequent speciation, as well as being located on the Indo-pacific, one of the world's most biodiverse ecosystems.

The number of species being found and recorded in the Philippines is still increasing each year, and it is only in the Indo-Pacific region where the rarest and most beautiful shells are found, most of them in great abundance (Oshima 1974). One particular island in the Philippines where rare shells are primarily collected is Balicasag Island in Bohol (**Figure 1**). There are few places in the world that can rival the



Figure 1. View of Balicasag Island, Panglao, Bohol, one of the prime collection sites in the Philippines.

Philippines as a shell locality (Talavedra and Faustino 1933). Even the old churches and houses in the country built during the Spanish colonization period (1521-1880) were constructed out of shells and corals. No wonder many people in the world regarded the Philippines as the “Pearl of the Orient Seas”.

History of the Shell Trade in the Philippines

Humans have been exploiting mollusks ever since the pre-historic period. Mounds of shells of clams and other bivalves were unearthed in sites that used to be the dwelling

places of ancient people (Gomez and Chavez, 1986). They suggest that ancient people utilized the mollusks as food and for making tools and ornaments. In the Philippines for example, the helmet shell *Cassis cornuta* or “budyong” are widely blown by farmers and fishermen using their mouths as a means of communication. Shells were also used as personal adornments among early Filipino settlers, especially among tribal communities. The abalone shell “Kapin” *Haliotis* sp. is reportedly being used in the healing practices among indigenous “Tambalan” communities in Sangat Island, Palawan. Shells are gathered around the waist of a sick person to cure his/her ailments.

Many pacific islanders were using shells as personal ornaments, a form of money, and for ceremonial gatherings. For example, the shell necklaces and bracelets worn by the Solomon and Trobriand Islanders indicate a high rank status among the villagers (Stacey 1973). The intricacy on a person’s ornaments is also a demonstration of his wealth and kind of fertility symbol. Sacred objects such as canoes and fine bowls were also inlaid with Mother-of-Pearl (MOP) and *Nautilus* shells (Stacey 1973).

The meat of mollusks, on the other hand, forms an essential part of the diet among the coastal people around the country, and for those families who can’t afford to buy fish. During certain seasons of the year, weather conditions limits fishing and so gleaning of mollusks or “panginhas” is the only means of livelihood. In Bais Bay, for example, a great proportion of income of the fishermen is obtained from gathering of mollusks (Alcala and Alcazar 1984). For a long time, mollusks provide livelihood among coastal communities in the area and in the neighboring towns including Dumaguete City.



Figure 2. A typical market scene in Dumaguete City, showing mollusks obtained from Bais Bay, Negros Oriental.

In the past, many fishing communities in the country did not value shells as much as the fish they caught. For example, a shell dealer from Mactan, Cebu narrated that fishing communities in Balut Island in Mindanao gathered shells in exchange for some kerosene to traders. On the other hand, shell collection has long been a highly regarded past time activity among the affluent families in the western countries. Many fishermen and shell collectors from the Philippines were also able to furnish the different museums

of the world a great variety of shells, which contributed much information on our present knowledge about shells. In 1963, for example, Voss reported that the Philippines furnished the United States National Museum more than 50 species of cephalopods obtained during the Smithsonian Institution Expeditions in the northern Luzon, Mindanao, the Sulu archipelago, and Balabac, south of Palawan.

Large-scale collection of shells has been occurring throughout the archipelago brought about by globalization of the trade market, wherein the Philippines is a major supplier of fishery products. Shells have become the status symbol among prominent people and fashion practitioners in some parts of the world. For example, when the former First Lady Imelda Marcos attended the coronation of the Shah in Iran, she brought with her some of the finest collections of shells from the country as gifts to the couple (Oshima 1974). Many of the shells that are known to have great value in the international market are obtained from the poor fishing villages in the country (**Figure 3**). Some of these shells command high prices, yet fisher folks are still living in poverty despite the bounty of their harvest.



Figure 3. A typical souvenir shop display showing a variety of shells for sale in Mactan, Cebu.

Today, shell gathering is a widespread activity throughout the coastal villages in the country. Even the indigenous “Tagbanua” in Coron Island, Palawan subsist, in part, by trading Troca shells “samung” and sea cucumber “balatan” to outside traders (see Dalabajan 2001). In Danao Bay, Zamboanga del Norte, gathering of shells and sea cucumber is also prevalent such that the average amount of shells caught per hour has declined substantially from over 18 kilos per hour in 1960 to only 3 kilograms in 1997 (Heinen 2001).

PROFILE OF THE INDUSTRY

Historical Development of Mactan Shell Industry

Mactan Island is located on the western side of Cebu, facing the Camotes Sea and the Cebu Sea. It has a total land area of 6,422 hectares, composed of 30 barangays (**Figure 4**). Its capital city is Lapu-Lapu, named after the famous chieftain of Mactan *Datu Lapu-Lapu* who successfully defeated Spanish invaders led by Ferdinand Magellan. It was in the historic “The Battle of Mactan” on the 27th of August 1521 where Ferdinand Magellan met his untimely death in the hands of *Lapu-Lapu* (**Figure 5**). Anecdotal evidence suggests that Magellan was slain while retreating due to his foot being caught in a giant clam “takobo”.



Figure 5. Lapu-Lapu shrine in Mactan, Cebu. Note also the shell necklace worn by the chieftain.

The cone shell *Conus Lapulapui* was also named after this great Filipino hero (Springsteen and Leobrero 1986). Today, Mactan Island is both an industrial and tourist destination site of Cebu. On the southeastern side of the island are found numerous beach resorts and hotels. Souvenir shops are scattered all over the island, selling shells and shell by-products. Export-oriented establishments dealing primarily with shells and shellcrafts are usually found in *barangay* Punta Engaño, although some of them may be found in nearby *barangays* such as Pusok, Mactan, Maribago, Marigondon and Bankal. Mactan Island is also famous for its world class guitars, many of which are inlaid with shells (**Figure 6**).

The shell industry had its early beginning in Zamboanga in southern Philippines. This was indicated in various reports and from personal accounts from shell collectors and researchers who have dealt with the shell trade in the country for several decades now. For example, a shell collector from Florida USA who used to be living in the Philippines has indicated that he has been dealing with shell traders in the Philippines since his high school days. He stressed that the trade center of shell in the country used to be in Zamboanga. However, due to security situation in the region, Sulu Sea and other prime collection sites in Mindanao became inaccessible to many traders and shell gatherers. It was also during this period that the Punta Engaño and other areas in Visayas such as Bohol and Samar were gaining popularity as prime collection sites of rare and common shells. In fact, some of the early shell collectors in the country were from Cebu, most notably the Cantos family in Mabolo who has been dealing with shells since 1951.

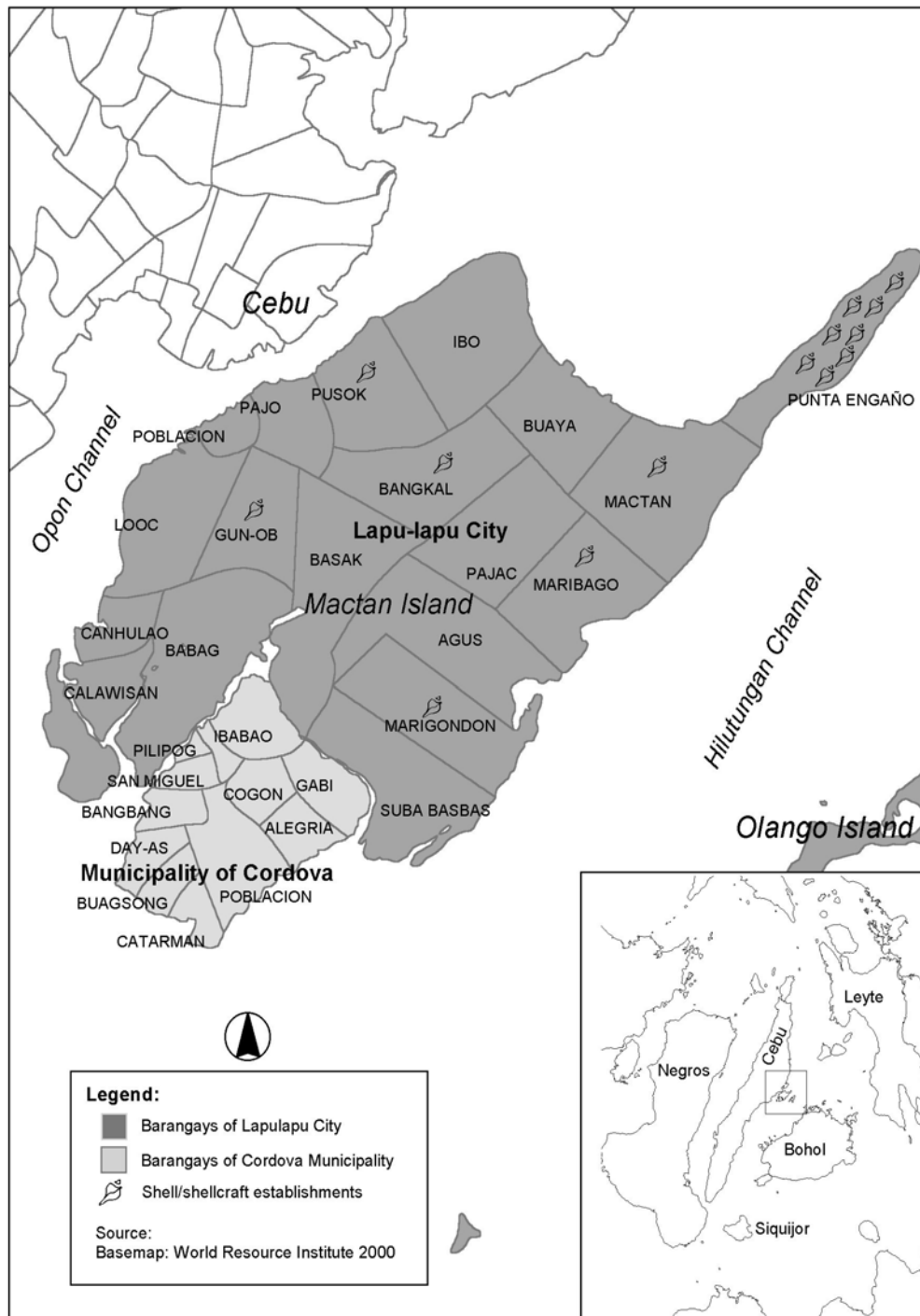


Figure 4. Map of Mactan Island, Cebu showing the major shell/shellcraft establishments.

Ms. Cantos recalls that his brother, the late Mr. Roque Cantos, was a pioneer in shell business in Cebu and that there were only about 2-3 exporters in the 1970s.



Figure 6. A guitar from Opon, Mactan inlaid with the abalone shell *Haliotis* sp.

The strategic location of Mactan, Cebu at the heart of the Visayas and the relatively peaceful situation in the area encouraged shell collectors to acquire shells from the fishermen in this area. With the development of the tourism industry in the Visayas region in the 1960's and 1970's, the government promoted shells and shellcrafts as souvenir items for tourists to bring back to their countries (Ruita 1974). The development of shellcraft industry of Cebu was also attributed to the increasing tourist arrivals in the country and by the government's effort in intensifying the development of cottage industries that are a potential dollar earner.

By 1974, there were already 13 shellcraft establishments in Cebu, registered at the National Cottage Industry Development Authority (Ruita 1974). It was also during this period when dealers of specimen or unprocessed shells were gradually evolving towards manufacturing shellcrafts. Roughly 80 percent of shellcrafts went to the world market while the rest were sold locally.

Shell exporters in Mactan indicated that their businesses were established around 1980, although some of them could no longer recall the exact year their business was established. Among the prominent shell traders in Punta Engaño were the Pagobo and Dungog families. One exporter in Punta Engaño started later in 1990; despite this however, their business is doing well. Today, the company is exporting, on the average, one container van (usual size 20 feet by 8 feet) per week. Another shellcraft manufacturer from barangay Gun-ob, who used to be living in the nearby Olango Island, has emphasized that he merely inherited the business from his father in the early 1980s who also dealt with shells before.

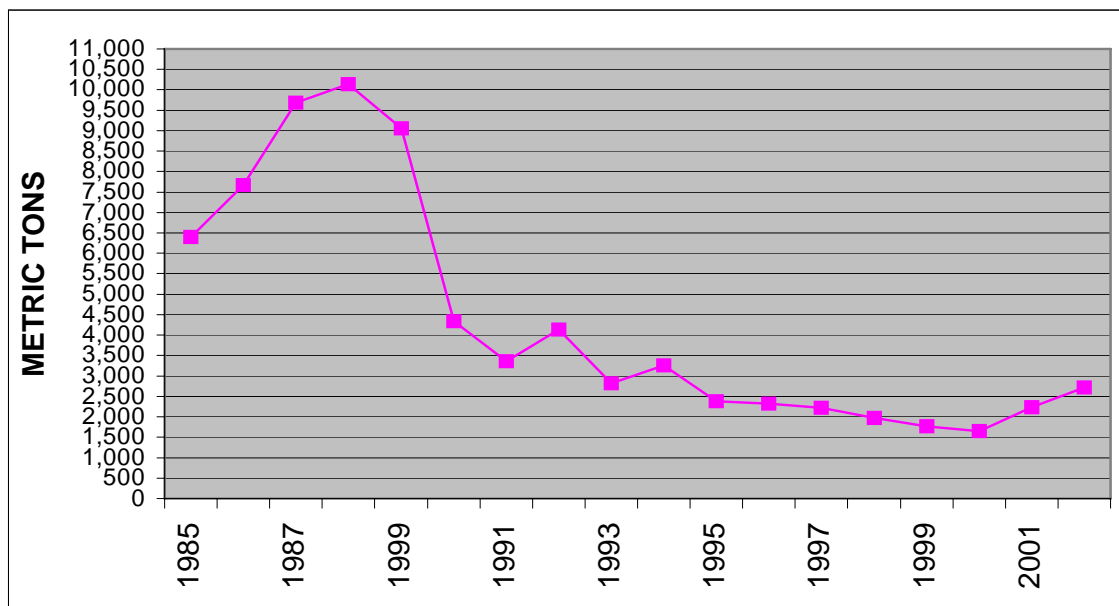
There seems to be an indication that the shell industry in Mactan has improved a lot from just a mere backyard industry in the early 1970's to a more labor-intensive production unit, and production has shifted towards exporting raw or ornamental shells in recent years. Large shell establishments are employing between 15 to 45 persons, mostly married women in their 40s. For those establishments with little capital, they have remained relatively small, employing less than 5 persons, mostly family members and friends. For example, one trader in *barangay* Mactan is working as an airport employee to augment the family's financial need while his wife attends their small shellcraft store.

Recently, foreign investors have established a shell business in Mactan through the use of the Internet. Specimen shells that are sold through the Internet are generally much more expensive than those obtained from the typical exporters since their shells are also obtained from the old-time exporters in Mactan. There is very little information on the extent of this trade, although they are apparently doing well in the business.

Current Reality

In 1981, Woods and Wells reported that the Philippines had an annual export production of around 4,168 t of unworked shells during the period 1977- 1979. The shell industry became a significant dollar earner for the country for several decades during the 1970’s and 1980’s. In 1988, export of shells and shellcrafts from the Philippines reached its peak with a total volume of roughly 10,000 t (BFAR 1988), making the Philippines as the top supplier of shells and shellcrafts worldwide. Since then, exports declined sharply from over 10,000 t in 1988 to only 1,600 t in the year 2000 (Figure 7). However, export of ornamental shells started to rise during the last 2 years. This is validated by the BAS Annual Report of 2002 and by the Summary Report of Exported Fishery Products in Region 7 (BFAR-7 Unpublished data) (Appendix A).

Figure 7. Total quantity of shells and shell by-products exported from the Philippines for the period 1985 - 2002. (Sources: Fisheries Statistics of the Philippine 1985-2001 and Philippine Fisheries Profile 2002)



On the other hand, Cebu alone exported 19, 565 t of shells and shellcrafts in 1999 worth some \$ 2.5 million (BFAR-7 Unpublished data). This is almost twice the value indicated in 1988. Surprisingly, this figure did not appear in the 1999 national publication of the Fisheries Statistics of the Philippines or in the Export Annual Report of the Bureau of Agricultural Statistics (BAS). This is apparently due to the communication problem

between the agencies dealing with data on fisheries. Nevertheless, Cebu has been exporting, on the average, roughly 24-25 t of shells and shellcrafts per day for the past 3-4 years. Some exporters also confirmed this, although this may reach up to 60 t per day.

Prices of common shells such as “sigay” *Cypraea annulus* or *Cypraea moneta* have gone up quite steadily in the recent years with the exception of some rare species (**Figure 8**). This suggests that “sigay” shells are increasingly difficult to obtain and that they have been harvested beyond their sustainable yield. In addition, there seems to be an indication that shell gathering has intensified in the recent years brought about by the increasing number of shell gatherers and shellcraft manufacturers. “Sigay” shells are reportedly scarce during certain months of the year and that they are relatively abundant during the months of April up to June.



Figure 8. The “sigay” shells *Cypraea moneta* used in the manufacture of shellcrafts and fashion accessories.

Many mollusks that used to be so abundant in the Philippine waters became extinct brought about by over harvesting. For example, the giant clam *Tridacna gigas* was reportedly became locally extinct in the Philippine waters brought about by over harvesting for food and ornaments (Alcala 1986, Villanoy *et al.* 1988). Population of *Trochus niloticus* in Honda Bay, Palawan has declined substantially due to over harvesting (Gonzales 2000), while previously productive beds of *capis* shell *Placuna placenta* in the western visayas were completely decimated brought about by destructive gathering methods (Rosell 1986, Adan 1998).

Various causes of the decline in the supply of shells have been indicated, such as over harvesting, habitat destruction and pollution. It is likely that increasing pressure on shell resources will be expected in the coming years considering the growing population and widespread poverty in the country. Monitoring and management of Philippine marine resources is only beginning, often after depletions and even extinction of species (Kelso 1996). It is possible that many marine species be harvested on a sustainable basis, if we knew more about their rates of growth and reproduction and could be sure that collecting methods did not cause damage (Wells, 1991). In addition, shells should be collected in sustainable quantities at a proper time and place so the resources can support fishing communities, shell dealers and exporters on a long-term basis.

With the declining quality and quantity of fish catches among the fishermen in the country, mollusks can be a good alternative source of protein for coastal communities, considering that the meat of mollusk is a good source of protein. Recently, however, food species of mollusks have become an export commodity. An example for this is the abalone *Haliotis asinina*, a highly priced delicacy. In fact, in 1999 the Philippines

exported nearly 300,000 kgs. of abalone to Australia, the U.S., and Asian Countries. This doubled in 1993 worth \$ 3.6 million (SEAFDEC 1997).

Fishery stocks in the Philippines have on the whole been harvested beyond their sustainable yield (Pauly 2000, Green *et al.* 2003) and mollusk resources are most likely in a similar state. There is however a growing concern as to the sustainability of the trade considering the lack of information about the species and exact volume of shells and shellcrafts exported from the country. Export records of shells and shellcrafts from concerned government agencies are highly variable and fragmented. This study therefore attempts to supplement historical data and put together a profile of the shell industry for the country.

Classification of Products

There are many species of shelled mollusks involved in the trade. This report has recorded a total of approximately 48 genera and 32 species of mollusks exported from Mactan, Cebu. One exporter has indicated that practically all species of common shells are exported from Mactan. These shells are also used in the manufacture of shell crafts such as the following items: 1) Kitchen wares - spoons, fork, bowls, stirrer, and knives. 2) Home and office decors - chandelier, lampshades, jewelry box, shell coins, pill boxes, pen holders, candle holder, curtains, table decors, and figurines. 3) Personal ornaments - bracelets, hairpins, necklaces, cameos, bangles, tassels, bags, and footwear. 4) Other uses such as inlays for guitars, floor tiles, paint component, children's toys and many others. This does not include other invertebrates such as sea stars, sponges, barnacles, corals, which are included in the shell trade.

However, there are four main categories of shells exported from Mactan, Cebu (**Appendix A**). These are the 1) Ornamental shells 2) Specimen and/or rare shells 3) Commercial shells and 4) Shellcrafts or handicrafts. However, it is important to note that the distinction between these categories is sometimes unclear, since a particular shell may be used for a variety of purposes depending on the demand. For example, the top shell *Trochus niloticus* and the pearl oyster *Pinctada spp.* are commonly used in the manufacture of buttons and inlays but it can also be used for as ornaments in the form of a polished shell. The giant clams *Tridacna spp.* have a variety of uses, such as in the manufacture of fashion accessories. Its meat is also used in common delicacy while empty shells are highly sought for decorative purposes. In Mactan, exporters are dealing with both shells and shellcrafts at the same time, although some of are mainly exporting fashion accessories made from shells. Wells (1988) has described these categories as follows:

Ornamental shells. These are the shells that are exploited for their whole decorative value, used as souvenir items and decorations. They are relatively cheap and plentiful in the trade (**Figure 9**). Examples are the tiger cowry *Cypraea tigris*, *Lambis lambis*, *Tonna spp.*, *Strombus spp.*, *Conus spp.* and other common shell found in shallow waters. These shells are exported primarily in the form of a shell pack or as unprocessed raw shells.



Figure 9. Ornamental shells represented by cone shells *Conus* spp. (Left) and shell pack or fruit shells (right).

Specimen and/or “Rare” Shells. These shells are sometimes endemic species of mollusks that are usually found in the deep seas (**Figure 10**). There are few of them in the trade and may cost from 50 to hundreds of dollars.

Some examples include *Cypraea guttata*, *Cypraea valentia*, *Cypraea leucodon*, and *Conus thomae*. Trading of specimen shells is usually accomplished through the use postal services or mail-to-order delivery.



Figure 10. Rare shell *Cypraea guttata* (Center), flanked by *Conus* sp. on the left and *Cypraea aurantium* (remodeled) on the right.

Commercial Shells. These are the mollusks that are harvested for their nacre or mother-of-pearl. *Trochus niloticus*, *Pinctada maxima*, *Pincta margaritifera*, *Turbo marmoratus* and *Haliotis* spp. are some common sources of mother-of-pearls (**Figure 11**). They are usually harvested in large quantities. The bivalve *Pinctada* spp., also known as the pearl oysters, produce natural fine pearls, many of which command high price and are mainly exported abroad. Pearl oysters have also been successfully reared in many pearl farms in the country, particularly in southern Palawan, which produce several metric tons of cultured pearls annually. Shells of these mollusks are used in the manufacture of buttons, shell tiles, fashion accessories, and as ornament.



Figure 11. Commercial shells used in the manufacture of buttons. Left photo shows top shells *Trochus* sp. and *Tectus* sp. while right photo shows the “brown lip” pearl oyster *Pinctada maxima*.

Shellcrafts / Handicrafts. These refer to the products made from shells or in combination with other native raw materials; they are usually hand-crafted by skilled individuals (**Figure 12**).



Figure 12. Shellcraft items made from shells displayed in shellcraft store and show rooms in Mactan and Cebu City. (Clockwise starting from top left: Chandelier, shell sandals, and Flower vase and Figurines).

“Capis”, also known as the windowpane shells were exploited for building houses during the Spanish colonization period in the country. Various churches and old houses in the early 1860’s in Cebu were built out of coral stone and “capis” shells.



Figure 13. Ancestral house Casa Gorordo Museum (Left), built from “capis” shell *Placuna placenta*. Right photo shows the wind chime made from similar material.

Casa Gorordo Museum, the home of the first Filipino Bishop of Cebu, Juan Gorordo (1862-1934) was constructed from *capis* shells (**Figure 13**). Antique furniture, such as the *capis* wall dividers are also found inside the museum.



Figure 14. An eighteenth century house in Dumanjug, western Cebu showing “capis” shells used for window construction. The first storey of the building was constructed out of coral stones.

Several other old houses and churches in southern and western Cebu were constructed from similar materials and coral stones (**Figure 14**). *Capis* shells have also been intensively used in the manufacture of shellcrafts such as lampshades, plates, ashtrays, wind chimes, glass covers, and many others.

THE COLLECTION PRACTICES

Methods of collection

“Perhaps nowhere in the world one would find as efficient as the Filipinos in gathering shells” remarks a shell trader. Filipinos are marine-oriented people, a feature quite unique among any other Asian people. In the Philippines, there are five major fishing methods employed by the shell gatherers: 1) Gleaning 2) Using tangle nets 3) Using push nets 4) Compressor diving and 5) Scuba diving (see **Appendix B**). Bamboo traps are also used in catching *Pterynotus miyokoe* (Family: Muricidae) (Dan, pers. com.), while hook and line and traps are used for catching chambered *Nautilus* spp.

Gleaning. Gleaning is the collection of marine species, especially invertebrates from the reef flat at low tide (Shoppe *et al.* 1998). Gleaners, mostly women and children, walk through the shallow tidal flats or seagrass beds and organisms are gathered in a basket or plastic containers. This kind of activity requires no special skills or fishing gears and shells are collected by hand, although many of them know where to find a particular organism in the reef flat. Sometimes shell gatherers use a “bolo” or spade to dig shells out of the substrate, others use pieces of wire for drawing the shells out of the holes in the sediment (Shoppe *et al.* 1998).



Figure 15. Typical gleaning activity “panginhas” in Mactan, where the tiny shells “mongos-mongos” (Family: Neritidae) are collected.

Gleaning or “panginhas” is a typical activity among coastal people throughout the country (**Figure 15**). It is usually done early in the morning and late in the afternoon during low tide. When gleaning is done at night it is called “manolu,” using a torch or “solu” made out of dried coconut leaves as light. Gathering of shells either for food and collection is both equally enjoyed by old and children alike. To others gathering of shells is a form of relaxing and a way of relieving stress.

Tangle net. In Balicasag Island, Panglao, Bohol, there are about 40 fishermen dealing in shell collection (Stockwell, pers. com.). Tangle net, measuring 1.5 m. by 50 m. in dimensions is dropped at 80-100 meters early in the morning or late in the afternoon. Each fisherman has 3 to 4 nets, composing of two types. The first one is made of large

mesh size for catching relatively big shells while the other one is made of fine nets for catching small shells such as “lamok-lamok” or *Latiaxis* spp.

Push net or “sud-sud”. Push nets or *Sud-sod* is a triangular-shaped nets supported two bamboo poles, being pushed forward by a person over the surface of a muddy substrate. It is used in gathering relatively small shells in the shallow waters to collect shells such as the cowrie *Cypraea annulus*. These shells are reportedly found in seagrass beds and have seasonal occurrence during the months of April through June.

Trawling with a use of a motorized boat destroys habitat of marine invertebrates and can kill new recruits of living organisms. The BFAR has prohibited the use of a motorized push net or *Sudsod* in the municipal waters under Fisheries Administrative Order (FAO) 201.

Compressor Diving. Compressor diving uses an air compressor attached to a tube that feeds oxygen to divers, enabling them to stay underwater for a few minutes to several hours. Shells are collected by browsing through the coral heads and other substrates. In Sillon and Hilatagaan Islands, Bantayan, Cebu, the Nailon shells (*Paphia* sp.) are gathered manually by the ‘huka’ divers using a compressor at a depth of 15-30 meters (Dacles, 1995). The average harvest is 200 kg per day of live shells. The meat is exported to Europe and Japan while the empty shells are sold to shell exporters.

Scuba Diving. Scuba diving uses a special kind of underwater breathing apparatus to collect shells and other invertebrates. There are reports of collecting shells inside marine sanctuaries, as it is easy for the divers to hide shells in their pockets. Divers are also difficult to monitor, and there are few inspections made by authorities of divers after they visit marine reserve.

The Process of Cleaning

The process in cleaning shells is quite a tedious process and is typically time-consuming (**Figure 16**). It typically follows the following steps:

- 1). Initially, raw shells are soaked in fresh water for approximately 24 hours to remove the soil and dirt that cling on shells, after which shells are rinsed with fresh water.
- 2) The next step in cleaning is to soak the shells in chlorine solution or muriatic acid at low concentration to remove the spot or stain from foreign objects that attached on shells.



Figure 16. Typical shell workers in Punta Engaño, Mactan, mostly women in their 40s doing different tasks in cleaning raw shells.

3) Finally, a brush may be used to thoroughly clean and then rinse with flowing water. Shells should be handled with an outmost care so as not to break the spines or any part of shells.

For some species of shells such as *Mitra* spp. and *Conus* spp., the process of cleaning is somewhat complicated for the shells have to be boiled in water to remove the outer covering or “skin” of shells. Cooking of shells may take 2-3 minutes. After which, they may be processed.

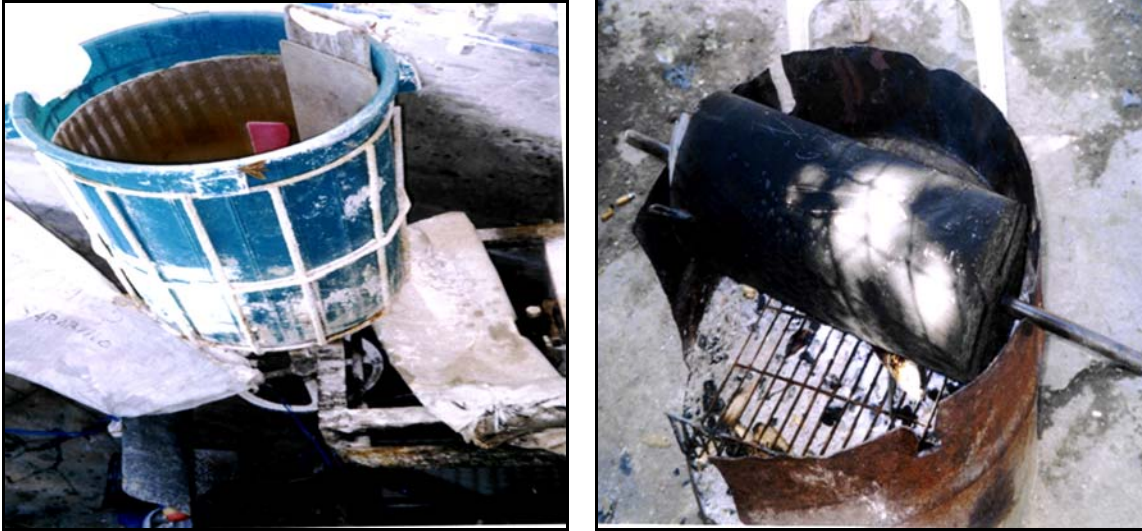


Figure 17. The “tambol” or tumble (left) used for cleaning shells for the manufacture of shellcrafts. Right photo shows modified steel oven called “sanga-gan” used for baking the shell “sigay” *Cypraea annulus* / *Cypraea moneta*.

The shells “litub” *Anadara* spp., used in the manufacture of shellcrafts, are gathered inside a vessel called “tambol” or tumble where shells are cleaned mechanically somewhat similar to a cement mixer (**Figure 17**). “Sigay” shells *Cypraea annulus* / *Cypraea moneta* are also baked in a modified steel oven called “sanga-gan” to add luster to the shells.

Shells such as chambered *Nautilus* sp., pearl oyster *Pinctada* spp., abalone *Haliotis* spp., helmet shell *Cassis cornuta* can also be cut into various sizes and shapes using a bench grinder for the manufacture of fashion accessories and shell tiles. The Philippines’ Technical Education and Skills Development Authority (TESDA) has developed a technical training manual on shell cutting and inlaying called the Training on Shells Inlaying (unpublished manuscript).

Philippine Collection Sites

Shells in Mactan, Cebu have been obtained from various parts of the Philippine archipelago, as far as Sulu in Mindanao, Bicol Region, Palawan, and all throughout the Visayan seas (**Figure 18**). This is somewhat contrary to some beliefs that shell gathering

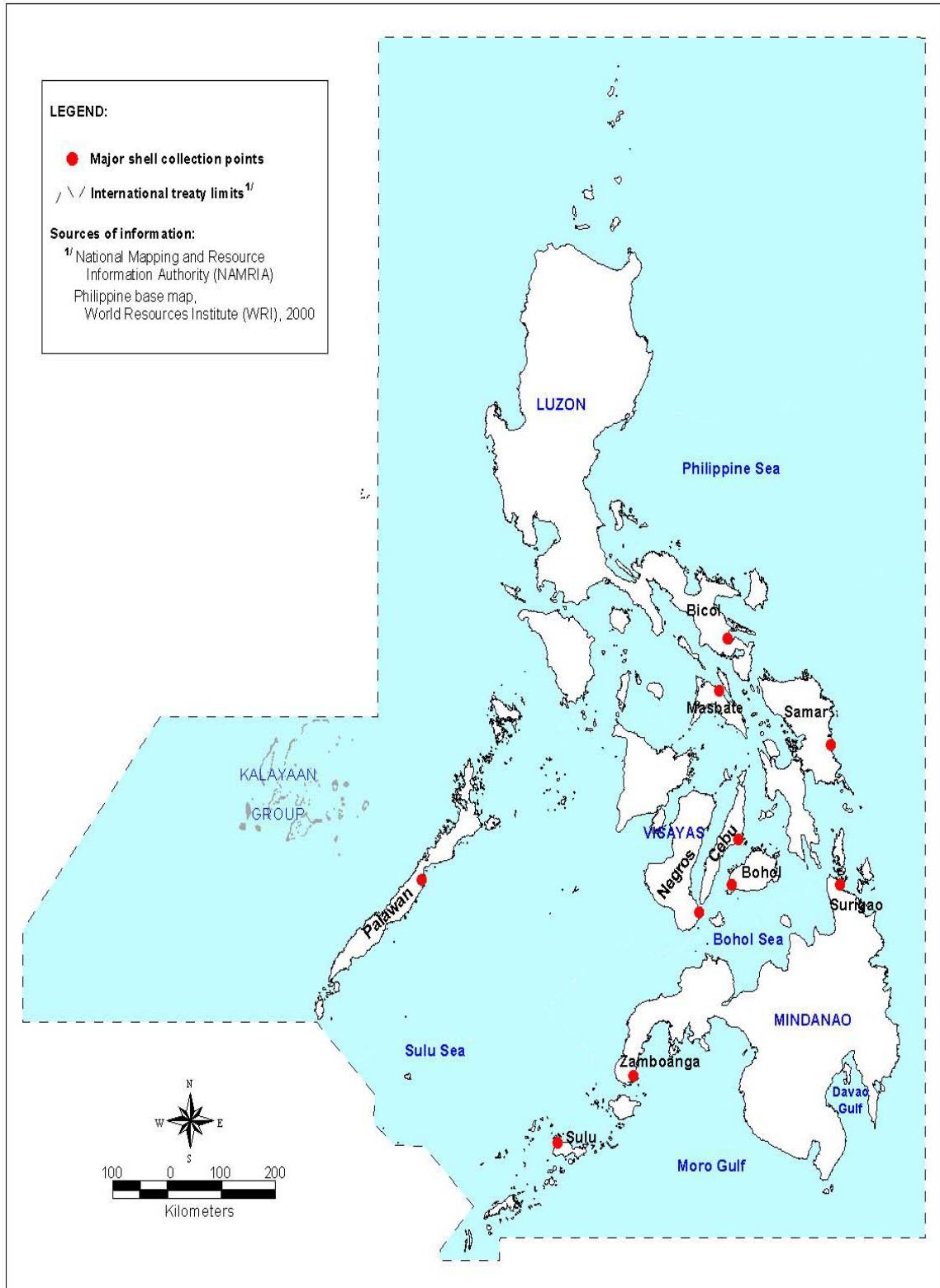


Figure 18. Major collection points of shells in the Philippines.

takes place only in the visayas area and that these shells are not in danger of over exploitation. Middlemen deliver raw shells directly to the exporters, usually in cartoons. These middlemen negotiate between the exporters and gatherers and they can command higher price (Ruita 1974.)

Generally, shells are bought by the kilo while most bivalve shells such as “litob” or *Anadara* spp. used in the manufacture of shellcrafts are bought by sack. Small-scale manufacturers of shellcrafts have to obtain “sigay” shell *Cypraea annulus* from the fishermen or from other shell dealers by the “bidol” (apparently referring to plastic container of an oil company Veedol- this unit is roughly equivalent to 1/4 kilo). *Sigay* shells are sold at PhP 20.00 per “bidol”. In turn, they sell their shellcraft item such as chandeliers at PhP 200 to 400 each (**Figure 19**)



Figure 19. A stall owner in Mactan, Cebu processing shells into shellcraft items.

On the other hand, rare specimen shells are bought by piece. Shells of these kinds are usually handled with outmost care. During a visit in Punta Engaño, for example, an old woman in her 60’s had her rare shells placed in a special casing. She proudly showed her fine collection of shells to prospective buyers and fellow dealers. The shells could probably be a *Cypraea globulus*, as nobody in the crowd was sure of the species. Shells of this kind are usually exported abroad using postal services or by mail order delivery. According to one seasoned trader in Mactan, rare specimen shells should be wrapped properly with tape and with label “Samples only” before bringing them to postal services so as to avoid delay of shipment. Rare specimen shells are also put at the bottom of the container van so as to hide them from the authorities.

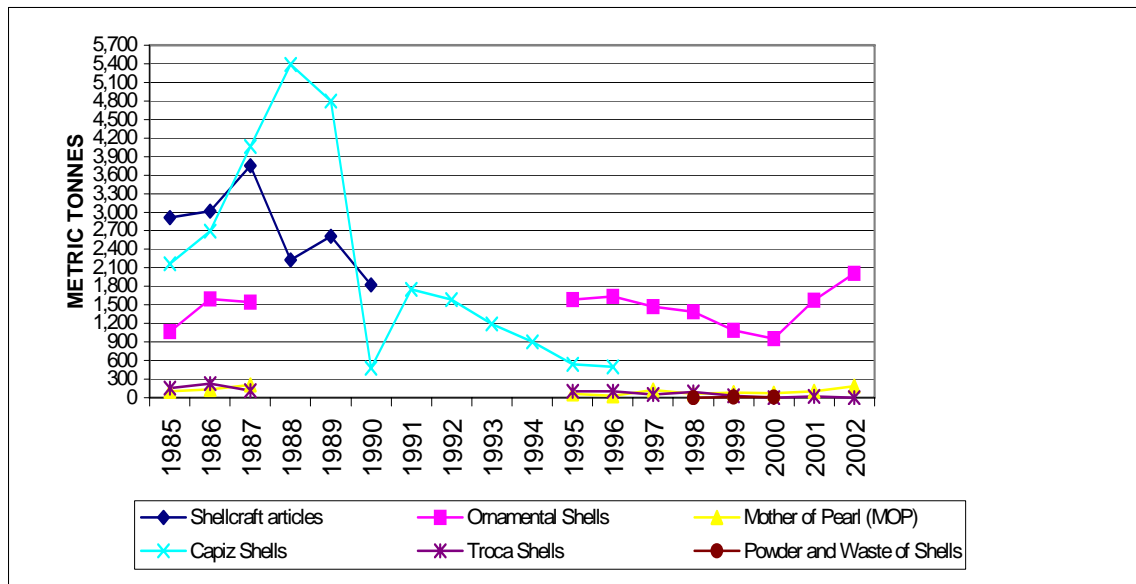
Recently, remodeled or fake shells belonging to the rare species of shells, such as *C. aurantium* and *Conus thomae* are gradually finding a market in the shell trade (see **Figure 10**. Fake shell is a new specialty in the world of shells (Poppe and Poppe 2003). At present, there is very little information as to how these shells are being made, although they are reportedly produced locally. However, this may imply that natural rare shells are increasingly difficult to obtain and that the demand of these shells is increasing. There is also a small handicraft industry making shells from wood for ornaments. These wood shells are not competing with the real shells though.

EXPORT PRODUCTION

Volume of Trade

The Philippines has been exporting shells and shellcraft to many countries since the 1950's (Wells 1981, Woods and Wells 1988). Exports increased through the 1970's and reached the peak in mid 1980's. From the period 1985 to 1987, for example, the Philippines was exporting between 2,100 to 4,000 t of raw *capiz* shell *Placuna placenta* to at least 41 countries on a yearly basis (**Figure 20**). This translates to an annual income of around thirty seven million pesos, which generated livelihood and business opportunities to a number of fishermen, shell dealers and shellcraft manufacturers.

Figure 20. Quantity of shells and shell products categorized into shellcraft articles, ornamental shells, mother-of-pearl (MOP), capiz shells, troca shells, and powder and waste of shells exported from the Philippines for the period 1885 - 2002. (Sources: Fisheries Statistics of the Philippines 1985-1987, Philippine Fisheries Profile 1988-1994, and BAS Annual Reports Unpub. data).



Based on the data obtained from BFAR-7, export of ornamental shells, classified as assorted raw shells, was only 1.7 t in 1999 (**Appendix A**). This rose sharply to 56 t in 2002 in just a span of 3 years. On the other hand, export of shellcrafts from Cebu has dropped from 19,565 t in 1999 to only 4,144 t in 2000. However, these figures were not reflected in the Export Annual Report of the Bureau of Agricultural Statistics (BAS) or in the Fisheries Statistics of the Philippines (1985-2001), apparently due to communication problem among agencies dealing in fisheries statistics. Nevertheless, it is estimated that Cebu is exporting, on the average, 24- 25 t of shells and shellcrafts daily for the past 4 years. Some exporters in Mactan confirmed this, although the production may reach up to 60 MT per day.

The major species and volume of shells exported from Mactan are listed in **Table 1**. A complete list of shells exported from Mactan, Cebu is provided in **Appendix A**. The values indicated were obtained from 7 respondents out of approximately 15 exporters in Mactan. Based on interviews, a regular exporter is exporting shells and shellcrafts twice a month, although some of them may export shells as frequent as 1-3 times a week. Small-scale and part-time exporters of shells may export only during certain months or peak seasons on the year (e.g. December through March). One trader in Pusok, Mactan, for example, has been exporting 4 metric tons of shells and shellcrafts on a monthly basis. Another trader has indicated that the helmet shell *Cassis cornuta* are exported at a rate of 5,000 to 7,000 pcs. (usual size 7-9 inches weighing approx.1 kilo each), while the top shell *Trochus* spp are exported 10,000 – 20,000 pcs (usual weight 3-10 pcs. per kilo) per month. This translates to around 6 t and 2.3 t of *Cassis cornuta* and *Trochus* spp., respectively, being exported per month.

Table 1. Major species of shells exported from Mactan, Cebu.

SPECIES	MONTHLY VOLUME OF EXPORT	SOURCES OF SHELLS	DESTINATION COUNTRIES
<i>Cassis cornuta</i>	5,000 -7,000 pcs.	Surigao, Masbate, Cebu	Asia and Europe
<i>Turbo</i> sp.	5,000-10,000 pcs.	Samar	United States
<i>Cypraea annulus</i>	0.5 ton; 5-20 tons	Palawan; Zamboanga	Asia, Europe and United States
<i>Cypraea tigris</i>	0.2 ton	Sulu; and Visayas	United States and Europe
<i>Cypraea</i> sp.	10,000 - 50, 000 pcs.	Zamboanga	Asia (China, Taiwan)
<i>Bursa</i> sp.	5,000 pcs.	nd	Japan
<i>Murex ramosos</i>	1,000 pcs; 1,000-2,000 pcs.	Punta Engaño and Bohol	United States (Florida); Asia (Taiwan); and Europe
<i>Lambis lambis</i>	5,000 pcs; 20,000 pcs.	Punta Engaño and Samar	Europe (Spain and Sweden)
<i>Lambis millapeda</i>	5,000 pcs; 20,000 pcs.	Punta Engano and	Europe (Spain and Sweden)
<i>Cypraea tigris</i>	5,000 pcs.	Punta Engano	Spain
<i>Fasciolaria</i> sp.	1,000 - 2,000 pcs.	Bohol	Mauritius Island
<i>Trochus niloticus</i>	1,000 -2,000 pcs	Bohol	Sweden
<i>Trochus</i> sp.	10,000 - 20,000 pcs	Palawan	Korea and Taiwan
<i>Tectus pyramis</i>	1 ton	Visayas; Bicol	United States and Europe
<i>Melo</i> spp.	300 - 500 pcs.	Bohol	Spain
<i>Pectin mobilis</i>	5,000 pcs; 100,000 pcs.	Masbate	Japan
<i>Spondylus</i> spp.	500-1,000 pcs	Nd	Japan
<i>Conus</i> spp.	Nd	Nd	Nd
<i>Strombus</i> sp.	Nd	Nd	Nd
White Clam	0.5 ton	Visayas	United States and Europe
<i>Placuna</i> spp.	0.2 ton	Masbate; Indonesia	United States and Europe
<i>Haliotis</i> spp.	0.2 ton	Africa; Mexico	United States and Europe
<i>Anadara</i> sp.	10 tons	Masbate; Negros	Unites States (California)
<i>Xenophora</i> sp.	5,000 pcs.	Visayas (Bohol)	Asia (China, Taiwan)
Other specimen shells	0.2 ton	nd	United States and Europe

note: nd = no data available

The most common shellcraft items exported from Mactan are the chandeliers, shell necklaces, lampshades, shell turtle toys, shell pack, and place mats (**Table 2**). For example, one exporter in Punta Engaño, has been exporting shell turtle toys at 5,000 pcs per month, while another shellcraft manufacturer in barangay Gun-ob is exporting 100,000 pcs. of shell necklace made from “litub” shells *Anadara* sp.

Chandelier, a shellcraft item made primarily from *Cypraea annulus* and *Nassarius* sp. (see **Figure 12**) are exported in a hundred to several thousand pieces per month. Likewise, place mats made from similar shells are exported at 500 kg. per month. Another common items exported in large quantities are shell packs, composed primarily of *Strombus* spp., *Conus* spp., and *Pectin* spp. (see **Figure 12**).

Table 2. Major shellcraft items made of shells exported from Mactan, Cebu.

SHELLCRAFT ITEMS	MAJOR SPECIES USED	MONTHLY VOLUME OF EXPORT	DESTINATION COUNTRIES
Necklace	<i>Anadara</i> sp.	100,000 pcs.	United States
	<i>Melo melo</i> .	5,000 pcs.	United States
	<i>Oliva</i> (black and brown color)	5,000 pcs.	United States
	<i>Trochus</i> sp.	5,000 pcs.	United States
	<i>Haliotis asinina</i>	6,000 pcs.	United States
	<i>Strombus lunhaunus</i>	5,000 pcs	United States
BRACELETS	All kinds of shells (e.g. <i>Pinctada</i> spp. <i>Haliotis</i> spp., etc.)	Thousands	Asia, Europe, and United States.
CHANDELIER	<i>Cypraea annulus</i> ; <i>Nassarius</i> sp.	0.2 ton; 100 pcs.; Thousands	Asia, Europe, United States (Florida)
WIND CHIME	<i>Anadara</i> sp. and sea urchin	Thousands	Asia, Europe and United States
	<i>Bula</i> sp.	100 pcs.	Europe (Spain)
LAMPSHADE	<i>Murex ramosos</i>	100 pcs.; thousands	Asia, Europe, United States (Florida)
TOYS (SAIL BOATS, RIDERS)	<i>Cypraea tigris</i> , <i>Haliotis</i> sp.	Thousands	Asia, Europe, United States
SHELL TURTLE TOYS	<i>Cypraea tigris</i>	5,000pcs.	Europe (Spain)
SHELL CURTAIN	<i>Pectin</i> sp., <i>Murex</i> sp., and <i>Bursa</i> sp.	500 – 1,000 pcs.	Japan
“NASSA” CURTAIN	<i>Nassarius</i> spp.	200 pcs.	Japan
TASSELS	<i>Polinices</i> sp.	1,000 pcs.	Japan
	<i>Strombus</i> sp.	1,000 pcs.	Japan

Table 2. Continued...

SHELLCRAFT ITEMS	MAJOR SPECIES USED	MONTHLY VOLUME OF EXPORT	DESTINATION COUNTRIES
SHELL PACK	<i>Strombus</i> sp.	20,000 pcs.	Europe (Sweden)
PLACE MATS	<i>Cypraea annulus</i>	0.5 ton (500 kgs.)	United States and Europe
PLATES	<i>Pinctada maxima</i>	0.2 ton (200 kgs.)	United States and Europe
POLISHED DECOR	<i>Atrina vexillum</i>	0.2 ton (200 kgs.)	United States and Europe
	<i>Conus species</i>	0.3 ton (200 kgs.)	United States and Europe

Shells and shellcraft items from the Philippines have been exported to the different countries worldwide. These items primarily went to the USA, Sweden, Spain, Mauritius, Japan, Korea, China and Taiwan (**Figure 21**). In 1986, the United States gets 40% of all handicraft export from Cebu while Europe and Japan get 22% and 19% respectively (Ng 1986).

Current Number of Shell / shellcraft Establishment

There are 101 exporters of fish and fishery products in the entire province of Cebu (BFAR-7 Unpublished data). Roughly 50 percent of these establishments are exporters of shells, shellcrafts, and fashion accessories made from shells. In 1974, there were only 13 shellcraft establishments in Cebu registered at the National Cottage Industry Development Authority (NACIDA) (Ruita, 1974). This has grown in recent years with over 24 shellcrafts establishments (DTI 2002). In Mactan, there are about 10-15 major shell exporters. Many fashion accessory (FA) firms are, in one way or another, using shells for the manufacture of buttons, bangles, necklace, hairpins, and cameo items. The Cebu Fashion Accessories Manufacturers and Exporters (FAME) Foundation has a total of 56 members. Overall, there are probably over a hundred shell and shellcraft exporters in Cebu.

According to the study made by the Department of Trade and Industry Cebu Provincial Office CPO) in 2000, the Cebu Fashion Accessories (FA) industry has remained relatively small in comparison with other with other key export industries. The study has also concluded that the FA industry is fairly doing well in the world market, although there seems to be an indication that foreign buyers have little concern for their suppliers in the Philippines and they are not considering the Philippines as their long-term allies.

With our vanishing marine resources, it is likely that more livelihood opportunities will be lost if we continue to be complacent about the unrestrained harvesting of shells for short-time gain. As has been demonstrated in many instances, management of resources only began after resources are depleted, such as in the case of the “capis” shells *Placenta placuna*, the giant clam *Tridacda gigas* and other related fisheries.

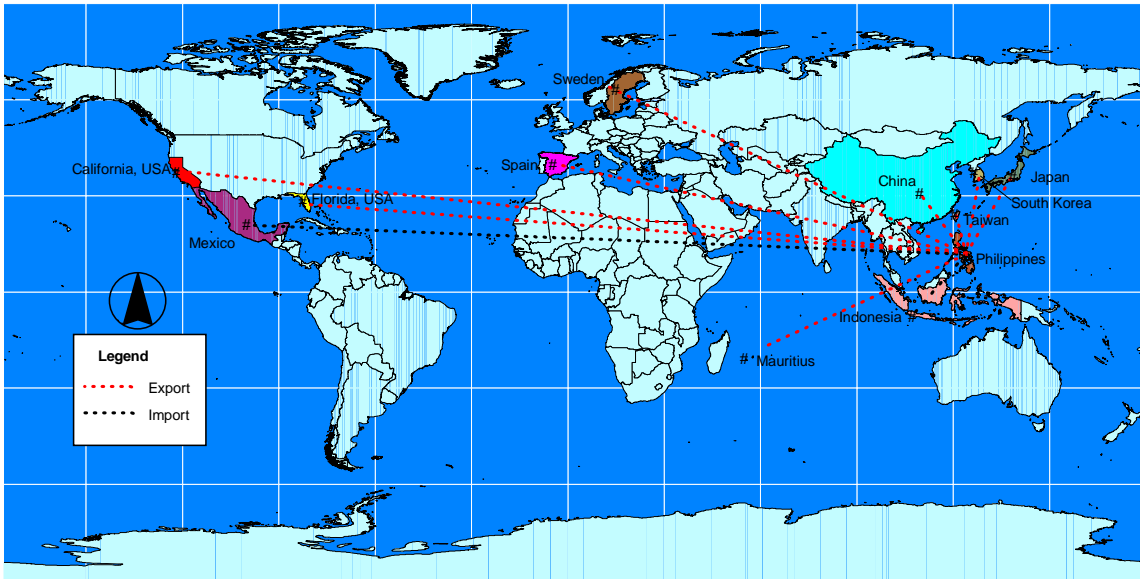


Figure 21. A world map, showing the major countries where shells and shellcrafts are exported from Mactan, Cebu.

PERCEPTION AND PROBLEMS OF INDUSTRY

Trends in the Supply and Demand of Key Shell Species

Most respondents in Mactan, Cebu indicated a decrease in the supply of raw shells despite that there is increasing number of suppliers. On the other hand, there has been a 10-50 % increase in the price of shells for the past few years despite the increasing number of suppliers. However, a seasoned trader from Mabolo, Cebu remarked that this figure (10-50 %) is a bit low. For example, the shell “sigay” *Cypraea annulus* or *Cypraea moneta* could only be bought at PhP 30.0 centavos per kilo in 1968. Then it went to PhP 12.00 to 14.00 in 1994. In year 2000, the shell fetched a PhP 50.00 per kilo, according a trader from

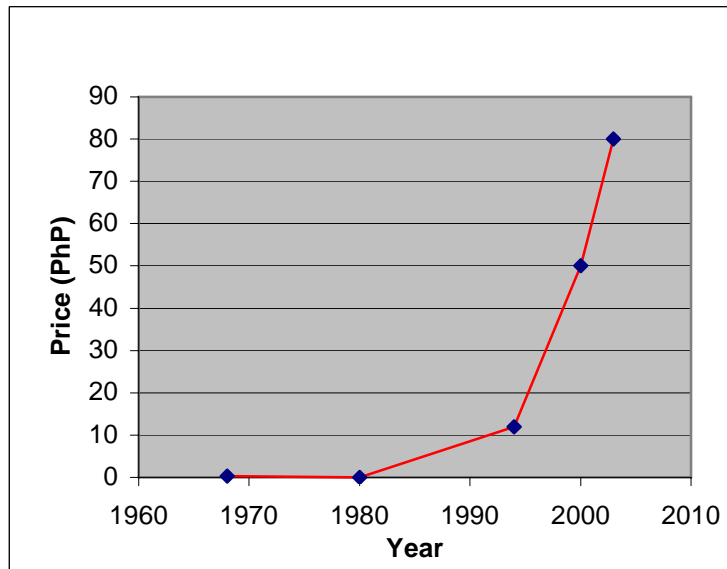


Figure 22. Cost per kilo of “sigay” *Cypraea annulus* / *Cypraea moneta*. (Source: Mabolo and Mactan Exporters)

Punta Engaño. Recently, it costs PhP 75-80.00 per kilo. The dramatic increase in price of the common shell “sigay” is shown in **Figure 22**. If the present trend continues, it is expected that by the year 2010 “sigay” shell would cost PhP 200.00 or even more - if there there’s still enough shells left in our seas. Already, some dealers from Cebu have been importing these shells from Malaysia to augment the decreasing supply from the country. This shell has been extensively used for the manufacture of shellcrafts and other fashion accessories.

The same is true with the shell “Nassa” *Nassarius* sp., in 1968 it only cost PhP 30.0 centavos per kilo, but now it costs PhP 18.00 per kilo. Another common shell that has improved a lot is the pink olive shell *Cypraea cribraria*. The shell only costs PhP 1.00, at the most, in the 80s, but now it costs 50.00 pesos, remarked a trader from Mabolo. Similarly, the prince cowrie *Cypraea valentia* initially costs PhP 6,000.00 and it went down to PhP 3,000.00 in year 2000, but now is worth PhP 15,000.00.

There are rare shells that have become fairly common though, including the “glory of the sea” *Conus gloriamaris* (**Figure 23**) and the “golden cowrie” *Cypraea aurantium*. *Cypraea leucodon* was priced at PhP 45,000.00 three years ago (2000) and now is PhP 15,000.00. The cone shell *Conus Thomae* from Balut Island was reportedly priced at PhP 17,000.00 in the 80s and it went as low as PhP 2,000.00 in the early 90s. In 2000, an exporter from Punta engaño, Mactan could sell *Conus Thomae* at PhP 15,000.00. This shell can be bought at 500.00 pesos from the fishermen or 1,000.00 pesos, at the most, depending on size, narrated a trader from Punta Engaño.



Figure 23. The cone shell “Glory of the Sea” *Conus gloriamaris*.

Generally, prices of shells depend on the supply and rarity of shells, although in some instances this depends on the knowledge of the buyers or collectors. For example, the common cowrie *Cypraea mapa* was bought by a trader at PhP 2.00 in the 70s and intended to sell them at 150.00; but one collector even mistakenly paid him 150.00 dollars instead! Some of these rare shells are considered as luxury items among westerners. The rare shells *Cypraea guttata* and *Cypraea Leucodon* were reportedly priced at US\$ 1,500 and US\$ 4,000, respectively; *Cypraea valentia* were considered priceless (Oshima 1974).

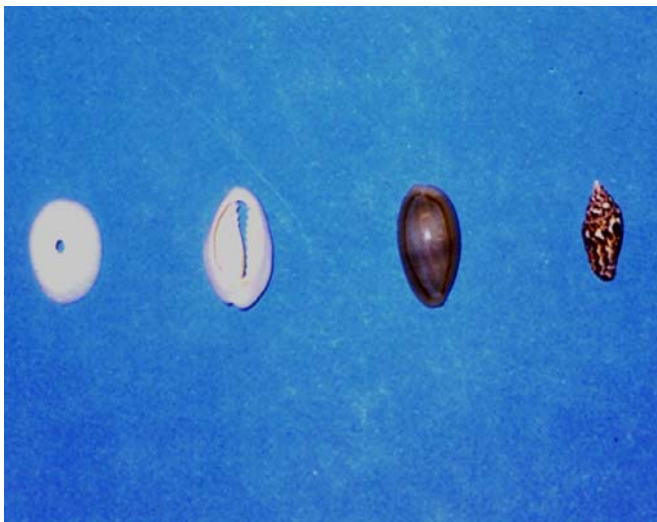
“The demand of shells in the market has remained relatively the same since the 1970s”, remarked a trader from Mabolo, Cebu. “Although this is probably due the large number of exporters today”, he continued. Likewise, most exporters in Mactan also indicated that the number of customers remained relatively the same. In general, prices of most common shells are steadily on the rise, while those of rare shells are variable and even erratic. In fact, one trader has suggested that it

would be unwise to store rare shells in large quantities because prices these items are fluctuate.

The Supply of “capis” *Placuna placenta* shells is no longer sufficient to meet the local demand of the capis industry; and shellcraft manufacturers need to import capis shells from other countries. One shellcraft manufacturer in Cebu has indicated that the company has been importing about 60 metric tons of capis shells from Indonesia every year, while those obtained from Masbate, Philippines amounted to only few kilograms, usually in 8-10 sacks. Potential income and livelihood are lost from the industry brought about by neglect concerning the resource. The window-pane shell *Placuna placenta*, once considered an almost a monopoly of the Philippine seas is now facing depletion (Madones –Ladja 1996).

Indiscriminate harvesting of our marine resources is often indicated as the major cause of poverty in the country. The lack of foresight and concern has, in some cases, completely decimated the dwindling wildstock population of fishery products in the country (Rosell, 1986). Had proper management schemes been started, considerable revenues and income could probably have been saved while capis shells, for example, might still be harvested in a sustainable manner.

A subcontractor (manufacturer of shell necklace, and component shells such as sliced “sigay”) from Gun-ob, Mactan said that he is earning between 5,000 to 50,000



pesos a month by supplying shellcrafts to an exporter in Mandaue and Cebu City. The income also varies throughout the year, although the month of September is the busiest month. On the other hand, large-scale exporters of ornamental shells were generally busy during the months of December through March (Figure 25). Most respondents in Mactan have indicated that raw shells were acquired mostly from the middlemen, who negotiate between the fishermen and the exporters.

Figure 24. (L-R) Component shells “Puka” and sliced *Cypraea annulus* used in the manufacture of fashion accessories. Further right are *Cypraea annulus* and *Nassarius* sp.

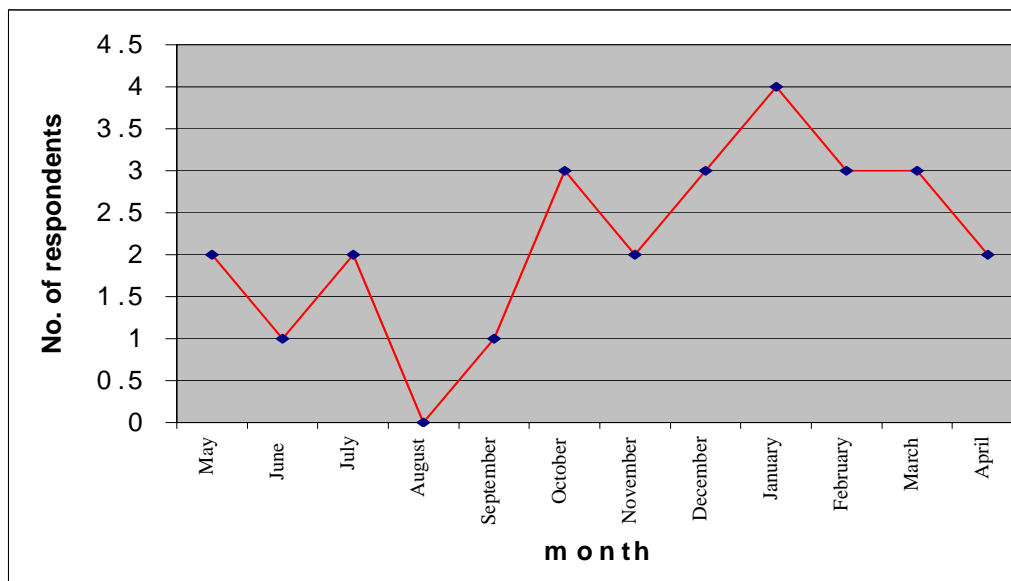


Figure 25. Peak months of export on shells and shellcrafts from Mactan, Cebu. (Source: Mactan Exporters).

Problems of the Industry

Competition within the business is among of most common problems cited by the exporters in Mactan. In 1974, the number of shellcraft establishments in Cebu registered at the NACIDA was only 13 (Ruita 1974). Today, there are over a hundred establishments dealing with shells registered at various government agencies and private organizations. Others have indicated that the supply of shells is not enough to provide for the increasing demand while still others have problems acquiring certain shells in particular months. To cope with the stiff competition, manufacturers of shellcrafts are developing new products in order to meet the demand of the changing markets (Ng 1986). There were also some establishments reportedly facing legal problems.

Many traders have expressed their disappointments over the passing of certain Fisheries Administrative Orders (FAOs) saying that these orders were made without fair consultations and sound scientific basis. In addition, some of the legislation are little understood by the traders, saying that the FAO 208, for example, are inconsistent or in conflict with the FAOs. One trader has claimed that the helmet shell *Cassia cornuta*, the trumpet shell *Charonia tritonis*, the top shell *Trochus spp.*, and the maxima clam *Tridacna maxima* are still abundant in nature.* However, most of the respondents believed that shells should be conserved to keep the industry alive. One particular exporter suggested a seasonal banning of shells for 1 to 2 years but must be allowed when the supply is enough. Another trader suggested minimum size requirements for gathering shells to protect the species from becoming extinct.

* Note that *Charonia tritonis* is rarely if ever seen by thousands of scuba divers all over the country and is thus extremely rare now.

LEGAL FRAMEWORK AND CONSERVATION MEASURES

A number of laws exist to control and regulate the collection and export of shells, both at the national and international level. Foremost of the international treaty is the Convention on International Treatise in Endangered Species (CITES), signed by over 109 countries, including the Philippines. The CITES prohibits the international commercial trade of seriously threatened species of plants and animals, as well the products made from them. It was created in 1973 as a conservation tool to prevent species from becoming threatened and to ensure their sustainable exploitation (Wells and Barzdo 1991). Included in the listing are all species of giant clams belonging to the genera *Tridacna* spp. and *Hippopus* spp.



Figure 26. Giant clam *Tridacna* spp. being used as filing materials in Punta Engaño, Mactan.

(Figure 26). At the national level, Administrative Orders issued by the Department of Agriculture – Bureau of Fisheries and Aquatic Resources (DA-BFAR) were created to prohibit and regulate the collection and gathering of shells. These Administrative Orders provide some management schemes in the form a permit system, prohibition of export on particular species, and size limits of mollusks that can be collected from the Philippine waters.

History of Legislation Initiatives

As early as 1935, the Department of Agriculture and Commerce issued an Administrative order (Fish and Game Administrative Order No. 11) requiring shell gatherers and shell divers to secure a license from the secretary of the Department of Agriculture (DA) for taking marine mollusca or shells. It also provided some criteria on the minimum sizes of marine mollusks that could be collected from the Philippine waters (Appendix C). This order was devolved to the Local Government by virtue of the Memorandum of Agreement (MOA) signed by the DA-BFAR and Local Government Units (LGUs) in 1994.

In 1986, the Ministry of Agriculture and Food issued Fisheries Administrative Order (FAO) No.157. It prohibits gathering, collecting, and removing of “kapis” shells *Placuna placenta* in the Philippine waters without a permit duly issued by the Director or his duly authorized representative. It also prohibits gathering of “kapis” shells less than 80 millimeters in diameter measured from the base perpendicular towards the top of edge of the shell. In addition, the use of mechanical rakes and dredges are prohibited in this order or the use of thereof on board a motorized boat. This order was devolved to the LGUs by virtue of the Memorandum of Agreement (MOA) signed by the DA-BFAR and

Local Government Units in 1994. During the same year (1986), the Fisheries Administrative Order 158 was issued which prohibits gathering, taking, collecting, and possessing for sale of mollusks belonging to the genera *Triton*, *Charonia* and *Cassis* (Figures 27 and 28).



Figure 27. The helmet shell “budyong” *Cassis cornuta*, a prohibited species under FAO 158, being displayed in a show room in Cebu City.

In 1990, the Department of Agriculture issued the Fisheries Administrative Order No.168. It prohibits gathering of wild *Tridacna derasa*, *Tridacna gigas*, and *Hippopus porcellanus* from the Philippine waters. This order also prohibits gathering of mollusks (Univalves: *Haliotis*, *trochus*, *Voluta*, *Mitra*, *Strombus*, *Murex*, *Oliva*, *Conus*, *Cypraea*, *Lambis*, and *Harpa*; Bivalves: *Tridacna*, *Hippopus*, *Pinctada*, *Pteria*, *Placuna*, *Amusium*, *Paphia*, *Katelsia*, *Atrina*, *Tapes*, *Anadara*, and *Pharella*) without a duly permit from the regional Director.

Under the Local Government Code of 1991 (RA7160), the “Local Government Units (LGUs) shall share with the national government the responsibility in the management and maintenance of ecological balance within their territorial jurisdiction subject to the provisions of this code and national policies”. This placed the local governments and cities at the forefront of sustainable management of marine resources (DENR *et al*, 2001). Under section 447 of this code, the LGUs have the duty to protect the environment and impose appropriate penalties for acts that endanger the environment, such as smuggling of natural products and of endangered species of flora and fauna. This LGC also fosters cooperation among the People’s Organizations (POs), National Government Agencies (NGAs) (i.e. DENR, PNP-MARIG, and PCG), Non - Government Organizations (NGOs), scientific institution and LGUs for the maintenance of ecological balance in the municipal waters.



Figure 28. Giant triton *Charonia tritonis*, a prohibited species under FAO 158, being displayed in a show room in Cebu City.

Under the Philippine Fisheries Code of 1998 (RA 8550), the BFAR and other concerned national agencies have the responsibility and jurisdiction in the management,

development, protection, utilization, and disposition of all fisheries of the country, except municipal waters. The municipality/city government shall have jurisdiction over municipal waters. The municipal/city government, in consultation with the Fisheries and Aquatic Resources Management Council (FARMC) shall be responsible for the management, conservation, development, protection, utilization, and disposition of all fish and fishery/aquatic resources within their respective municipal waters. In particular, the Fisheries Code of 1998 authorizes the LGUs to seek assistance of the BFAR in the training of the *Bantay Dagat* Task Force in fishery laws, apprehension techniques, and gathering of evidence.

Recently, the DA-BFAR issued the FAO No. 208 which prohibits any person from taking, gathering, or causing be taken 27 species of rare gastropods, 2 species of rare bivalves and 7 species of giant clams (see **Appendix C**). Practically almost all species of common shells are under local government jurisdiction, except for a few rare, threatened and endangered species covered in the FAO No. 208.

CONCLUSION

The Philippines has worthwhile legislation and strict laws pertaining to shells. If these are implemented properly, then it is likely that the shell industry could provide more livelihood and job opportunities to a number of Filipinos. Using appropriate management schemes, there could be many more shells obtained from our municipal waters. Enforcement of FAOs at the municipal/city levels is practically non-existent. There is however a difficulty in the enforcement of these orders considering that many shell collection sites are located in remote areas and in small islands where concerned agencies are do not exist.

RECOMMENDATIONS

Most recommendations presented in this report are based on the recommendations made by Wells (1988) and from the exporters in Mactan. This report ultimately hopes that shells can provide continuous and sustainable income to the shell gatherers and exporters and to our country, without sacrificing the future of the industry. Aside from the permit system and minimum size requirements, the government should consider the following recommendations:

- Establish more Marine Protected Areas (MPA's) that protect shells and shell habitats in addition to other resources. This will allow breeding stocks to replenish areas where shells are harvested.
- Work with the industry to help assist them in their needs with a bias towards management.
- Continue and carry out basic research on the distribution, population studies, and breeding seasons of mollusks. However, research should focus on the common species of shells, especially those that are used in the manufacture of shellcrafts. These shells have been harvested in great quantities and could contribute a great deal of income for

the country if properly managed. Rare shells are usually deep-water species, and they are not likely to be danger of overexploitation with non-destructive fishing methods.

- Increase public awareness on the importance, uses, and the rate at which mollusks are harvested in nature through the use of educational materials such as brochures and through the media. Most often, the public is not aware that overexploitation of shells exist.
- Strict enforcement of existing Fisheries Administrative Orders that stipulate minimum size requirements and a permit system.
- More information to be passed for the sellers in the area on the biology of the different species.
- Seasonal banning of certain shells for 1-2 years but must be allowed when the supply of shells is enough.
- Data on export of shells and other related fisheries should be handled by one agency so as to avoid loss or change of the data in the process.

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APPENDICES

Appendix A Trade Volume

Table 1. Volume of export on shells (in tons), categorized into 5 major groups from 1995-2002. (Source: BAS Annual Report Unpub. data)

Product items	1995	1996	1997	1998	1999	2000	2001	2002
Troca shells	105.5	102.0	55.7	91.6	30.5	7.6	19.0	1.8
Mother-of-pearl	61.7	34.6	120.7	59.8	87.6	77.1	105.6	183.6
Ornamental shells	1,588.4	1,642	1,474.4	1,389.6	1,091.2	957.8	1,572	2,010.1
Powder and waste of shells				4.5	12.0	7.0		

Table 2. Volume of export on shells and shellcrafts (in tons) exported from region 7, particularly Cebu. (Source: BFAR-7 Unpublished data)

Product items	1999	2000	2001	2002
Shellcraft	19,565.1	4,144.0	4,785.3	6,365.3
Troca shell	11.1	12.0	15.1	
MOP	9.5	29.7	9.1	58.0
Ornamental (Assorted raw shell)	1.8	9.8		56.6
Capis shell			3.0	12.9

Table 3. Species of shells exported from Mactan, Cebu.

SPECIES	RESPONDENTS							FREQUENCY
	1	2	3	4	5	6	7	
Gastropods								
<i>Trochus</i> spp.	*	*	*	*		*	*	6
<i>Haliotis</i> spp.	*	*		*	*	*		5
<i>Melo</i> spp.	*	*		*	*	*	*	6
<i>Mitra</i> spp.		*		*	*	*	*	5
<i>Strombus</i> spp.		*		*	*	*		4

Table 3. Continued...

SPECIES	RESPONDENTS							FREQUENCY
<i>Murex</i> spp.		*	*	*	*	*	*	6
<i>Oliva</i> spp.	*	*		*	*	*		5
<i>Cypraea</i> spp.		*		*	*	*	*	5
<i>Lambis</i> spp.		*	*	*	*	*	*	6
<i>Harpa</i> spp.		*		*	*	*	*	5
<i>Patella</i> spp.		*			*	*		3
<i>Fasciolaria</i> spp.		*		*	*	*	*	5
<i>Guilfordia</i> spp.		*	*	*	*	*	*	6
<i>Distorsio</i> spp.		*		*	*	*	*	5
<i>Tonna</i> spp.		*	*	*	*	*	*	6
<i>Charonia</i> spp.		*		*				2
<i>Bursa</i> spp.		*	*	*	*	*	*	6
<i>Natica</i> spp.		*		*		*		3
<i>Neritina</i> spp.		*			*	*	*	4
<i>Cassis</i> spp.		*		*		*		3
<i>Argonauta</i> spp.		*		*		*	*	4
<i>Turbo</i> spp.		*		*	*	*	*	5
<i>Terebra</i> spp.		*		*	*	*	*	5
<i>Cymatium</i> spp.		*		*	*	*	*	5
<i>Fusinus</i> spp.		*				*	*	3
<i>Tibia</i> spp.		*		*	*	*	*	5
<i>Cellana</i> spp.		*		*	*	*		4
<i>Conus</i> spp.		*		*		*		3
<i>Rysota</i> spp.		*			*	*		3
<i>Bula</i> spp.				*				1
Others:								
Common shells of any family						*		1
<u>Bivalves</u>								
<i>Pinctada</i> spp.		*				*	*	3
<i>Placuna</i> spp.			*					1
<i>Atrina</i> spp.						*	*	2
<i>Pteria</i> spp.						*		1
<i>Tapes</i> spp.						*		1
<i>Anadara</i> spp.	*							1
<i>Tridacna</i> spp.				*	*			2
<i>Spondylus</i> spp.		*	*	*			*	4
<i>Hippopus</i> spp.		*						1
<i>Pecten</i> spp.		*	*	*	*	*	*	6
<i>Cardium</i> spp.		*				*		1
Others:								
<i>Pecten pallium</i>				*				1
<u>Rare Species</u>								
<i>Cypraea aurantium</i>		*					*	2
<i>Cypraea valentia</i>		*					*	2
<i>Cypraea martini</i>		*						1
<i>Cypraea beckii</i>		*						1
<i>Cypraea guttata</i>		*						1
<i>Cypraea porteri</i>		*						1
<i>Cypraea teramachii</i>		*						1
<i>Cypraea childreni</i>		*						1
<i>Cypraea saule</i>		*					*	2

<i>Cypraea catsue</i>		*						1
<i>Cypraea leucodon</i>		*						1
<i>Bolma girgyllus</i>		*						1
<i>Cypraecassis rufa</i>		*						1
<i>Phalium glabratum</i>		*						1
<i>Phalium coronadoi</i>		*						1
<i>Recluzea lutea</i>		*						1
<i>Tibia martini</i>		*		*		*	*	4
<i>Morum kurzi</i>		*					*	2
<i>Morum grande</i>		*						1
<i>Morum watsoni</i>		*						1
<i>Amusium oblitratum</i>		*						1
Others:								
<i>Conus gloriamaris</i>				*				1
<i>Nautilus sp.</i>				*				1

Note: * = present

Appendix B

Key Responses to the Survey Questionnaires

Table 1. Motivations of respondents in establishing a shell business.

Motivations	Respondents							Total
	1	2	3	4	5	6	7	
Hobby		*			*	*	*	4
Abundance of Raw Materials		*		*	*	*		4
Influx of Tourists		*		*				2
Profitable enterprise	*	*		*	*	*		5
No other choice of livelihood							*	1

Table 2. Types of shells and shell products exported by respondents in Mactan, Cebu

Products	Respondents							Total
	1	2	3	4	5	6	7	
Ornamental Shells		*			*	*		3
Specimen or "Rare" shells		*						
Commercial Shells		*				*	*	3
Shellcrafts and/or shells	*	*	*	*	*	*		6
Shellcrafts only		*			*	*		3

Table 3. Types of fishing gears used fishermen / gatherers in collecting shells, as indicated by the exporters.

Collection Methods	Respondents							Total
	1	2	3	4	5	6	7	
Gleaning		*		*	*	*	*	5

	Respondents							Total
Tangle nets		*		*			*	3
Push net		*						1
Compressor Diving	*	*			*	*	*	5
Scuba Diving							*	1
Others: Free diving							*	1

Table 4. Trends in export of shells and shellcrafts from Mactan, Cebu.

Respondents	Months											
	Jan	Feb	Mar	Apr	Ma	Jun	Jul	Aug.	Sept.	Oct.	Nov.	Dec.
1				*	*	*	*					
2	*	*	*							*	*	*
3	*	*										
4	*								*	*		*
5							*					
6	*	*	*									
7			*	*	*					*	*	*
Total	4	3	3	2	2	1	2		1	3	2	3

Appendix C

An annotated Bibliography on the Shell Resources of the Philippines

I. General aspects

Gomez, E.D., and Chavez, V.B. 1986. Research on the Philippine Mollusks. In: Proceedings of the Seminar-Workshop on Status of Mollusk Resources and Prospects for Development. Ecotech Center, Cebu City. May 2-3, 1986. pp. 5-14.

This paper reviews the past and present researches on mollusk resources in the Philippines. The report covers aspects such as identification, distribution, biology and physiology, and biochemical studies of mollusk. The oldest report on mollusk dates back in 1890. Aspects pertaining to stock assessment, utilization, and marketing of mollusk should be conducted so that a wise management of these resources can be made.

Licuanan, W.Y. 1986 Gasropod Research: An Overview. In: Proceedings of the Seminar-Workshop on Status of Mollusk Resources and Prospects for Development. Ecotech Center, Cebu City. May 2-3, 1986. pp. 31-33.

This report indicates that there are few studies done on marine gastropods in spite of their great number. In 1981 alone, the abalone *Haliotis* spp. earned an estimated of 932,213 pesos from the export sales. Other species that are commonly used in shellcraft

industry include the following: the conches *Strombus* spp. and *Lambis* spp.; the golden cowry *Cypraea aurantium*; the abalone *Haliotes* spp.; the top snail *Trochus* spp.; green snail *Turbo* spp. and cone shell *Conus* spp. The report emphasizes a need to assess local population of gastropods and determine their capacity to withstand fishing pressure.

Gabral-Llana Ma. E. The bivalves. In: Proceedings of the Seminar-Workshop on Status of Mollusk Resources and Prospects for Development. Ecotech Center, Cebu City. May 2-3, 1986. pp. 29-33.

This paper reviews research activities done on bivalve mollusks in the Philippines. Bivalves that are of major commercial value include the following: 1) giant clams *Tridacna* spp. and *Hippopus* spp. 2) mussels *Perna viridis* and *Modiolus* spp. 3) window-pane shells *Placuna placenta* 4) cockles *Anadara* spp. and *Katylisia* spp. 5) scallops *Amusium pleuronectes* 6) oyster *Crassostrea* spp. 7) mother of pearl shells *Pinctada* spp. and 8) wing shells *Pholas orientalis*.

II. Taxonomy

Cabrera, J.J. 1986. Taxonomy and Geographic Distribution of Philippine mollusks. In: Proceedings of the Seminar-Workshop on Status of Mollusk Resources and Prospects for Development. Ecotech Center, Cebu City. May 2-3, 1986. pp. 24-27.

This report indicates that there are about 22,000 species of mollusks in the Philippines or roughly 18% of the total number of species throughout the world. This number represents only a fraction of fauna that existed in the long evolutionary history of animals. There are more than 200 new species are found each year.

Sotto, F.B. 1982. Some Commercial bivalves of Cebu, Philippines. *The Philippine Scientist* 119: 43-101.

This report indicates that there are sixty species belonging to 22 families of commercial bivalves found in Cebu. The methods of collecting bivalves by gatherers are also described. Most of the bivalves are collected by hand, although spades, tangle nets, bottom trawls and dredge are sometimes used. Notes on the bivalves' distribution, habitats and utilization are also presented in this report.

Voss, G.L. 1963. Cephalopods of the Philippine Islands. Smithsonian Institution, Washington.

This a report on the cephalopods that were collected from numerous trawling and dredging sites in northern Luzon, Mindanao, the Sulu archipelago, and Balabac, south of Palawan during the period 1907-1909. There were 46 species of cephalopods and 8 new species identified during the cruise.

Talavera, F. and Faustino L 1933. Edible Mollusks of Manila. *The Philippine Journal of Science* 50 (1).

This paper provides an old record of all species of shells that are sold and used as food around Manila during the period 1929-1933. It also provides some notes on their occurrence, habitats, culture and uses.

III. Collection Methods

Schoppe, S., Gatus, J., Milan P., and Seronay, R.A. 1998. Gleaning Activities on the islands of Apid, Digyo and Mahaba, Inopacan, Leyte, Philippines. *The Philippine Scientist* 35: 130-140.

This report describes the gleaning activities of fisherfolks, mostly women and children, in the three islands of Inopacan, Leyte based on interviews and survey questionnaires. Mollusks ranked first among the organisms gathered with 28 species of gastropods, 9 bivalve species, 2 nudibranchs and one species of octopus. The impact of gathering of mollusks is readily seen in the damage caused by overturning and breaking on corals and browsing and digging in seagrass beds.

Flores, E.C. 1986. Harvesting of Marine Mollusks. In: *Proceedings of the Seminar-Workshop on Status of Mollusk Resources and Prospects for Development*. Ecotech Center, Cebu City. May 2-3, 1986. pp. 69- 81.

This paper provides a list the major groups of marine mollusks heavily exploited in the Philippines, based on data obtained from the Philippine Fisheries Statistics (BFAR) during the period 1976-1982. The group consisting of squids, cuttlefish and octopus ranked first while the giant clams, cockles, and kapis shells ranked second of the total mollusk harvested from the Philippines. Stationary mollusks may be simply collected by using hand instruments such as rakes and shovels. Unregulated further development of existing fishing gear might only lead to the destruction of the mollusk resources in the country. A better reporting on marine mollusk used in the shellcraft industry is suggested.

IV. Biology

Llana, Ma. E. and Aprieto, V.L. 1980. Reproductive Biology of the Asian moon scallop *Amusium pleuronectes*. *Fisheries Research Journal of the Philippines* 5 (2): 1-10.

This study describes the reproductive biology of *Amusium pleuronectes* obtained from the Visayan seas from 1976 to 1977. Results indicate that the scallop is a hermaphrodite and sexually matures when it reaches of about 54 mm in height. This species has a variety of uses, such as a source of food, for making shellcraft, and for lime manufacture. Export of scallops from 1974 to 1978 has amounted to over 525,000 kg valued at 12 million pesos.

V. Exploitation

Villanoy, C.L., Juinnio, A.R., and Menez, L.A. 1988. Fishing Mortality Rates of the Giant Clams (Family Tridacnidae) from the, Philippines. *Coral Reefs* 7: 1-8.

This report provides information regarding the fishing mortality rates of the giant clams (Tridacnidae) from the Sulu archipelago and southern Palawan by utilizing export records and warehouse inventory in Zamboanga City during the period 1978- 1985. The findings indicate that the populations of giant clams from these areas are heavily exploited brought about by indiscriminate harvesting of clams for food and for commercial purposes. Highest exports of giant clams were recorded during 1979-1981, after which exports declined towards 1994 with a very slight increase in 1985. With the banning of exports for giant clams in 1987, it was anticipated that exports of clams would decline or stop in the coming years.

Magsuci, H., Conlu, A., and Aypa-Moyano, S. 1980. The Window-Pane Oyster (Kapis) Fishery of Western Visayas. *Fisheries Research Journal of the Philippines* 5(2): 74-80.

This paper has documented the rich fishery grounds of the window-pane oyster *Placuna placenta* in the western visayas. In Capiz province alone, a total of 42,555,379,410 kapis bivalves were collected valued at about 850,000,000 pesos for the period 1977-1978. This report also indicates the destructive method of gathering Kapis shells using a dredge that caused complete decimation of shells in the area. Consequently, the rich Kapis fishery in Tigbaun, Miagao, and Guimbal collapsed in 1973 and recovered 4 years later, considering that there was no regulation pertaining to proper collection of shells in their natural habitat.

VI. Economics

Anonuevo, Ma.V., and Zaragoza, E.C., 1986. Marketing Practices for Raw Shells, Ornamentals and Shellcraft. pp. 83-93.

This paper provides some results of the marketing aspects of seashell industry in Metro Manila, Cebu, and Zamboanga City for the period 1981-1982, based on interviews and survey questionnaires. Shell gatherers sell their items directly either to the manufacturers/processors/cleaners and to the government and other institutional users. Gathering of shells is usually financed by the gatherers themselves, although sometimes dealer companies take the burden of the transportation cost and finance gathering of shells. The manufacturers, in turn, sell their products to the local consumers, foreign market and government and other institutional users. Sometimes local retail outlets (e.g., department stores and souvenir shops) and export trading firms act as middlemen in the buying process. Promotion is usually done abroad through personal selling, direct mailing, store displays and exhibits. About 80% of shellcraft production in the Philippines is imported to the United States and Europe.

Ng, J. 1986. Industry Status, Problems and Prospects. In: Proceedings of the Seminar-Workshop on Status of Mollusk Resources and Prospects for Development. Ecotech Center, Cebu City. May 2-3, 1986. pp. 15-18.

This paper describes primarily the economic aspect of the shellcraft industry in region 7. There are 125 handicraft firms in the region, 76 % of which constituted predominantly of shellcraft firms. As of 1983, the industry has generated 95 million mostly from export sales. The United States gets 40% of all export while Europe and Japan get 22% and 19%, respectively. Prospects of the industry remain bright considering that new lines of products are continuously made to meet the demand of the changing market.

Ruita, J. A. 1974. A Study of the shellcraft Industry in Cebu City. MBA Thesis. University of San Carlos. Cebu City. Pp. 41- 161.

This study has dealt with the following aspects on shells: 1) history of shellcraft industry in Cebu, 2) the procedures, techniques, and materials used in making certain shellcraft products 3) the description of the shellcraft facilities, and 4) the problems of the shellcraft industry. It also indicates that the vast resources in the coastal areas of Cebu and neighboring provinces are largely untapped, and support from the government for the shell industry development was primarily encouraged.

VII. Conservation and Management

Wells, S.M. 1989. Impacts of the Precious Shell Harvest and Trade: Conservation of Rare or Fragile Resources. In: Marine Invertebrate Fisheries: Their Assessment and Management. John F. Caddy (editor). John Wiley and Sons, New York. pp. 443-454.

This report suggests that shells have been traded into two broad categories: commercial and ornamental shells. Commercial shells are those which are harvested for their nacre or mother of pearl, such as *Pintada maxima*, *Trochus niloticus*, *Turbo marmoratus* and *Haliotis* spp. Ornamental shells are those that are rare, sought by shell collectors and used in the shellcraft industry. Ornamental shells are primarily tropical species and that trading of specimen centered in the Philippines, mostly on a personal or mail-to-order basis. In addition, they received very little scientific information compared species valued as food. Removal of certain predatory species mollusks from the reef might have an adverse effect on the ecological balance. International trade statistics showed that the Philippines exported less than 1000 tones in the year 1960's and rose to 3,400 tones in 1979. This declined in 1981 with only 2,300 tones valued at U.S. \$ 3.5 million. The report has suggested some recommendations for the sustainable exploitation of mollusk resources.

Gonzales, B.J. 20002. *Trochus* Restocking Enhancement Intervention. In: Sagip Dagat. Second Quarter. pp. 11-13.

This is a first report on the restocking effort of *Trochus* population in Honda Bay, Palawan, initiated by FRMP- Puerto Princesa City. Reseeding protected coral reefs with juvenile *Trochus* from hatcheries was believed to enhance *Trochus* population in the bay.

Rosell, N.C. 1984. Mariculture of Kapis, *Placuna placenta*: a pilot study. Fisheries Research Journal of the Philippines 9 (1-2). pp.

This paper describes areas in the Philippines previously known to harbor large populations of *Placuna placenta* but completely decimated brought about by the rapid proliferation of shellcraft industry. The possibility of rehabilitating destroyed beds of *Placuna placenta* was also explored through mariculture.

VIII. Aesthetic Value

Oshima, Chiye. 1974. Collecting Shells in the Philippines. Arts of Asia 4(1): 37-44.

This article describes Philippines as one of the richest shelling areas in the Pacific. There are 449 shellcraft producers listed with the National Cottage Industries Development Authority (NACIDA). Collectors/hobbyist are prohibited from collecting poor specimen unless it is of rare species; and a turned over rock or dead coral should be returned to its original position after the shell has been obtained. Deaths of shell gatherers have also been reported in Samar, brought about by collecting poisonous cone shells such as *Conus geographus*. Overcollecting of shells has been responsible for the denudation of prime collection in many areas.

X. International Treatise and Agreements

Wells, S. M. and Barzdo, J.G. 1991. International Trade in Marine Species: Is CITIES a useful Control Mechanism? Coastal Management 19: 135-154.

The convention on International Trade in Marine Species (CITES) was created as a conservation tool to prevent species from becoming threatened and to ensure their sustainable exploitation. It prohibits commercial trade in seriously threatened species listed in the Appendix 1. In 1981, CITES revealed that over 40,000 shells were exported from the Philippines to Taiwan largely unreported.

Wells, S. M. 1981. International Trade in Ornamental Shells. IUCN Conservation Monitoring Centre. 291 c Huntingdon Road, Cambridge CB3 0DL, United Kingdom. pp. 1-22.

This paper describes the Philippines as the main suppliers of ornamental shells destined primarily to the US and Europe, based on international trade statistics analysis. It has been shown that of exports of shells have increased over the last decades and there are reports of local depletions of some species. There are few studies as to the exact quantity of shells being taken from nature. International trade statistics are often

inaccurate and rarely describes the species being traded. Thus, it has always been difficult to assess the effects of shell collection on the natural population of mollusks.

XII. Trends in Shell Export Production

Bureau of Fisheries and Aquatic Resources - Region 7. Unpublished data. Summary Report of Exported Fishery Products. Arellano Boulevard, Cebu City.

Export annual production of ornamental shells (classified as assorted shells) in 1999 was only 1.7 t. This rose to 9.8 t 2000 and reached up to 57 t 2002. Likewise, export value of ornamental shells was estimated to have decreased from \$ 5.95 per kg. of shells in 1999 to only \$ 0.82 in 2002 based on the BFAR-7 data. Troca shell export also increased from 11 t 1999 to 15 t in 2001. Its market value also dropped from \$ 4 per kg of shells in 1999 to only \$ 1 in 2002. The Mother of Pearl (MOP) export was only 9 t in 1999 and rose to 30 t in the year 2000. A marked decrease in export of MOP was recorded the following year, 2001, with only 9 t. In the same year, export value of MOP also rose to \$ 4.58 per kg of shells from \$ 2.65 in 2000. In 2002, MOP exports sharply escalated to 54 t and its value dropped at \$ 1 per kg of shells, the lowest price for the past 4 years. On the other hand, Capiz shells appeared in year 2001 export record, with an annual production of 3 t. This rose to 13 t in 2002 with a corresponding decrease in its market value from \$ 6 per kg. in 2001 to only \$ 2 in 2002.

Exports of shellcrafts in 1999 reached up to 19,565 t valued at \$ 2,466,419. This declined sharply in 2000 with only 4,144 t and gradually increases towards 2002 with an annual production of 6,365 t. The export value of shellcrafts escalated over the period of time regardless on the supply of this product. The total quantity of shellcrafts exported during the period 1999- 2002 reached up to 34,860 t valued at \$ 45,444,046.00. This quantity represents 99 % of the total shell exports in Cebu for the period 1999-2002. All in all, Cebu has exported 35,085 MT of shells and shell products from approximately 25 exporters in just a span of 4 years. This is equivalent to roughly 24-25 t of shells and shellcrafts being exported abroad on a daily basis.

BFAR Fisheries Statistics of the Philippines. 1985 -1996, and BAS Annual Report 1995-2002.

The Philippines has exported a total of 6,401 metric tons of shells and shellcraft items in 1985. This rose to 10,133 t in 1988 in a span of 3 years. Shellcrafts and capiz shells ranked 4th and 7th, respectively, in the major export products of the Philippines in the year 1988, with a total export value of PhP 375,169,000. This declined dramatically towards the end of 1991 with an annual production of 3,357 metric tons. Since then, shell export production practically declined towards 2000 with barely 1,654 t. It also marked as the lowest shell export record for the past 16 years. A slight increase in shell export production was observed in 2002 with an annual export of 2,714 t. The bulk of this shell export, however, was primarily obtained from ornamental shells. Waste and powder of

shells were exported starting from 1998 up to 2000 with an average yearly production of total of 8 t.

The Philippines has been exporting shells and shell products to at least 38 countries, although majority of these items primarily went to USA, Hongkong, Korea, China, United Kingdom, Italy, Poland, Netherlands, and Spain.

IX. Legal Framework

A. National Level

Fish and Game Administrative order No. 11. 1935. Rules and regulations for the protection of marine mollusks

This order provides some criteria on the minimum sizes of some marine mollusks allowed to be collected. The mollusks that are covered in this order are the following: 1) *Pinctada maxima*, 19 centimeters measured at right angle to the base. 2) *Pinctada margaritifera*, 11 centimeters measured at right angle to the base. 3) *Trochus niloticus*, 8 measured across the least diameter of the base. 4) *Trochus maximus*, 7.5 centimeters measured across the least diameter of the base. 5) *Trochus noduliferus*, 5 centimeters measured across the least diameter of the base. 6) *Trochus marmoratus*, 9 centimeters measured across the least diameter of the base. It is thus unlawful to any person to collect and sell these shells at sizes smaller than those mentioned above.

Fisheries Administrative Order 157. Rules and regulations on the gathering, taking, removing, or collecting of Kapis of the species *Placuna placenta* in the Philippine waters.

This order prohibits gathering of Kapis *Placuna placenta* with measurements less than 80 centimeters in diameter. In addition, any person is required to secure a permit from the Director of the Fisheries and Aquatic Resources before gathering and collecting this particular species.

Fisheries Administrative Order 158. Series of 1986. Prohibition on the gathering, taking, collecting, selling, transporting, or possessing of mollusks, belonging to the genus *Triton* or *Charonia* and *Cassis*.

This order prohibits any person from gathering or for having in possession mollusks of the genus *Triton* and *Cassis*. Research and educational institutions may be allowed to acquire these species upon the issuance of a special permit from the director of Fisheries and Aquatic Resources subject to terms and conditions.

Fisheries Administrative Order no. 168. Series of 1990. Rules and Regulations governing the gathering, culture and exportation of shelled mollusks (Phylum Mollusca).

This order prohibits gathering and/or culturing of shelled mollusks without any permit, license or gratuitous permit issued by the Regional director of the Fisheries and

Aquatic Resources. The genera of mollusks that are covered under this order are the following: *Nautilus*, *Argonauta*, *Haliotis*, *Trochus*, *Voluta*, *Mitra*, *Strombus*, *Murex*, *Oliva*, *Conus*, *Cypraea*, *Lambis* and *Harpa*; Bivalves – *Tridacna*, *Hippopus*, *Pinctada*, *Pteria*, *Placuna*, *Amusium*, *Paphia*, *Katelsia*, *Atrina*, *Tapes*, *Anadara*, and *Pharella*.

Fisheries Administrative Order No. 208. Conservation of rare, threatened and endangered fishery species.

This order any person to take or catch or cause to be taken the following fishery/aquatic species:

A. Rare species

1. Gastropods:

<u>Scientific Name</u>	<u>English Name</u>
<i>Bolma girgyllus</i>	girgyllus star shell
<i>Clypomorus aduncus</i>	bent cerith
<i>Cypraea aurantium</i>	golden cowrie
<i>Cypraea beckii</i>	Beck's cowrie
<i>Cypraea childreni</i>	children's cowrie
<i>Cypraea guttata</i>	great spotted cowrie
<i>Cypraea Katsue</i>	Katsue's cowrie
<i>Cypraea leucodon</i>	white-toothed cowrie
<i>Cypraea mariae</i>	Marie's cowrie
<i>Cypraea martini</i>	Matini's cowrie
<i>Cypraea porteri</i>	Porter's cowrie
<i>Cypraea saulae</i>	Saul's cowrie
<i>Cypraea teramachii</i>	Teramachi's cowrie
<i>Cypraea valentia</i>	prince cowrie
<i>Cypraeacassis rufa</i>	bullmouth helmet
<i>Malluvium lissus</i>	deep sea cap
<i>Morum grande</i>	giant morum
<i>Phalium coronadoi wyville</i>	Wyville's bonnet
<i>Phalium glabratum glabratum</i>	Smooth bonnet
<i>Phenacovolva dancei</i>	dance volva
<i>Recluzea lutea</i>	recluzia snail
<i>Separatista blainvilliana</i>	true separatista
<i>Strombus thersite</i>	thersite stomb
<i>Tibia martini</i>	martini's tibia
<i>Varicospira criplate</i>	network beak shell

2) Bivalves:

<i>Amusium oblitteratum</i>	smudged moon scallop
<i>Eufistulana mumia</i>	club-shaped boring clam

B. Threatened Species

1. Gastropods

<u>Scientific Name</u>	<u>English Name</u>	<u>Local Name</u>
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<i>Barnea manilensis</i>	Angle wing shell	diwal
<i>Tochus niloticus</i>	Smooth top shell	samong, simong, tuwad
<i>Turbo marmoratus</i>	Green snail	laong, bulatok

C. Endangered species

1. Clams

<u>Scientific Name</u>	<u>English Name</u>	<u>Local Name</u>
<i>Tridacna gigas</i>	True giant clams	<i>Taklobo</i>
<i>T. derasa</i>	Smooth giant clam	<i>Taklobo</i>
<i>T. squamosa</i>	Fluted/scaly giant clam	<i>Hagdan-hagdan</i>
<i>T. maxima</i>	Elongated giant clam	<i>Manlet/Manlot</i>
<i>T. crocea</i>	Boring/crocus clam	<i>Let-le</i>
<i>Hippopus hippopus</i>	Strawberry/horsehoof clam	<i>Kukong</i>
<i>H. porcellanus</i>	China/porcelain clam	<i>Kukong kabayo</i>