A short history of gleaning in Negros and Panay Islands, Visayas, Philippines

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Abstract

Gleaning for seafood along the seashore to supplement the food requirements of coastal villages is a widely known and accepted activity in the Philippines. However, its importance in the socio-economy of the fishing communities is not fully appreciated. This study fills this gap by reporting the empirical data on gleaning gathered from 3 sites in Negros Island and 1 in Panay Island, Central Philippines. The weighted catch per unit effort (CPUE) is calculated at 2.31 kg·day⁻¹·fisher⁻¹ and 1.23 kg·day⁻¹·fisher⁻¹ for Negros Island and Banate Bay, Panay, respectively. Gleaning in Agan-an, Bantayan, Cangmating, and Piapi in Negros Oriental is for subsistence and sharing with relatives, and the excess sold to neighbours but gleaning in Bais and Banate Bays are not only for subsistence, but also for livelihood. Gleaning catch in Bais Bay, Negros Island and Banate, Panay Island is estimated at 58 t and 27 t in 2012, valued at 2.38 million PHP and 0.404 million PHP, or 59,500 USD and 10,100 USD respectively.

Introduction

Studies on gleaning are sparse in the Philippines (see Palomares et al. this vol.). In the Visayas, a comprehensive study on gleaning was conducted in Bais Bay, Oriental Negros in the early 1990s (Leblanc 1997). This study described gleaners, the collecting sites, the resources, and retailing the catch. The gleaners are an informal sector of society who compete for coastal resources. Gleaning is an important activity for sustenance and livelihood, depending on the needs of the household. The social importance of gleaning is more obvious than its contribution to the economy.

Several studies have reported information on gleaning. Edible molluscs, cephalopods, and holothurians harvested in the Bay were identified in Alcala and Alcazar (1984) and efforts to conserve these invertebrate populations began already in the early 1990s (ERMP-DAP 1991 and Silliman University 1992, unpublished reports). The composition of invertebrates in the harvest from Banate was described in Campos et al. (2005), while the Bureau of Fisheries and Aquatic resources (BFAR, 2012) prepared a guide on the commercially-important shellfish in Banate.

Gleaning is reported as an activity to supplement the food of coastal villagers (e.g., Ablong et al. 1999, LeBlanc 1997), but total catch from gleaning is presumed negligible and are not recorded in marine fisheries statistics. Here, we report that gleaning contributes greatly to coastal fisheries catch, and that its

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⁸⁹ The views and opinion expressed in this paper are those of the authors and do not represent their organizations.

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level is a function of the coastal population that depends on it in Negros and Panay islands, in the Visayas islands (i.e. within Subzone C as defined in Palomares et al. this vol.).

**Materials and Method**

**Study sites**

The study sites are in Negros Island and Panay Island in Visayas (Figure 1). The two islands are adjacent to each other and separated by the Guimaras Strait, which is a shipping channel. The study sites were limited to the eastern provinces of these islands and are briefly described below.

The Province of Oriental Negros has an extensive, mangrove-lined coastline along Tanon Strait. The area covered mangrove stands, with parts converted to fishponds, cropland, and settlements was reported at 5,030 ha (Ablong et al. 1999). Most of the mangrove forests are found in Bais Bay but it has decreased from 812 ha in 1979 to 250 ha in 1999 (Luchavez and Abrenica 1997; Murphy et al. 1999). Seagrass beds are also found in some parts (Bantayan, Dumaguete City), but their area is not known. Fringing coral reefs are also found along the coastline and cover an area of 26 km² (Montebon 1997; Ablong et al. 1999). Coral reef condition has declined from 1981 to 1995; 56 % of coral reefs have less than 30 % coral cover (Montebon 1997; Murphy et al. 1999). Piapi and Bantayan, and Cangmating and Agan-an, are adjacent to each other along the coast, north of Dumaguete City (Figure 1). The habitat in Piapi and Bantayan consists of a wide reef flat, with isolated coral heads and patches of sea grass beds, while the habitat in Cangmating and Agan-an consists of a wide mud-flat. Bais Bay, located about 100 km north of Dumaguete City, has sandy-muddy substrate and sea grass beds. Bais Bay has an area of 54 km² and the gleaning area is the intertidal strip that is composed of mangroves forests, seagrass beds, and reef flat. These coastal ecosystems provide food and livelihoods to the population of the province (Ablong et al. 1999).

The fishing communities in Bantayan, Cangmating, and Agan-an are dependent on fisheries (Yambao et al. 2001). The coastal communities that live in the villages (barangays) near Dumaguete City were mainly artisanal fishing communities in the past 50 years. Cangmating had a population of 2,206 and 128 fishers who landed 22,000 kg·year⁻¹ (Murphy et al. 1999). The profile of the villages has changed in the last 10 years with the growth of the economic activities associated with shipping (near Piapi) and tourism, i.e., with the extension of the runway and number of flights to airport in Sibulan. The extension of the runway in the 1980s has caused erosion in Bantayan and Piapi while it caused accretion in the fishing communities of Cangmating and Aga-an.. The coastline from Piapi northward to Cangmating has restaurants, a resort, and picnic facilities along the beach. These have provided alternative employment to the men and women in the coastal communities and a few persons who fish.

The coastal community of Bais Bay is an artisanal fishing community since its founding (see Cabanban et al. this vol.). Gleaning activity is an informal, but important economic activity by its members and the workers in the sugar plantations (described comprehensively by Leblanc 1997). There were 25,223 gleaners and 3,077 coastal fishers in 1993-1994 (Leblanc 1997) who exploit the resources in the gleaning area, but with only 250 doing so on a daily basis. About 82 % were reported land-less laborers and workers in the haciendas who glean for food subsistence and only 18 % are from coastal and upland communities that glean for subsistence. The profile of the gleaners remains the same because sugar planting and milling remain as the main economic activity around the city.

The catch of gleaning are consumed and sold to traders (Leblanc 1997). A diverse group of molluscs are taken from mangrove forest floor and intertidal area and sold fresh by the bus terminal, at the local market, and in Dumaguete City market. Some wild oysters are shucked and preserved in brine and sold in the markets. The empty shells are sold to souvenir-makers in Cebu.
Iloilo Province is in the eastern part of Panay Island, the third largest island in the Philippines with a population of 2.2 million in 2010 (http://www.nscb.gov.ph/ru6/western.htm). Iloilo has 18 coastal municipalities with patches of mangrove stands in protected areas (Zamora, 2003), seagrass beds (Trono, 2003), notably in Guimaras, Nueva Valencia, and coral reefs (Ajuy and Concepcion), and mud-flats in Banate. The marine waters off Estancia have rich marine resources and as such commonly known as the ‘Alaska’ of the Philippines, with the best developed fishing port in the northern Visayas.

Banate Bay, at 50 km north of Iloilo City, is a sandy-muddy intertidal area of about 1,315 hectares. The Bay is under the jurisdiction of Anilao, Banate, and Barotac Nuevo. There are 1,315 fishing households in 22 barangays commonly share and benefit from this bay. The Bay is an important fishing ground as source of seafood and livelihood for the local people and Iloilo City.

Negros and Panay Islands are not in the usual path of typhoons in the Philippines, although the depression that is associated with the typhoons is usually experienced in these islands. Yolanda (internationally known as Haiyan), a super typhoon landed – among other places – on Concepcion – the 5th District of Iloilo Province. The typhoon brought heavy to intense (10-30 mm hour\(^{-1}\)) rain and caused flooding in the Second District of northern Negros Island. Yolanda had wind strengths of 215-250 km hour\(^{-1}\) that rendered 90% of the 212 inhabitant of Concepcion homeless and displaced coastal communities including those in Banate, where coastal waters rose by 4.1 m. The typhoon is reported to have affected 9,000 fishers in all of Panay.

**Methodology**

Interviews were conducted by the first two authors in Negros Oriental (Piapi, Bantayan, Cangmating, Agan-an, and Bais Bay) and in Banate, Panay Island in 2012 using a questionnaire (Appendix I), designed by the first author, to define the profile of the gleaners and gather information on the following:

- number of persons in the family who are gleaning;
- start of gleaning;
- recollection of historical catches;
- implements used in gleaning;
- use of vessel;
- number of hours gleaning per day;
- number of days gleaning per month;
- habitat where gleaning is done;
- catch of gleaning at present; use of catch (consumption, sharing, selling); and
- monitoring of catch by authorities.

Interviews in Agan-an, Bantayan, Cangmating, and Piapi were conducted with the assistance of a fisher, while that in Bais City was conducted with the assistance of a government staff. The interviews conducted in Banate were conducted by an assistant with a degree in fisheries.
Profile of respondents

In Negros Oriental Island, a total of 195 respondents were interviewed in the localities adjacent to Dumaguete City, most of whom were men (90%; Table 1), while 101 persons were interviewed in Bais Bay, the majority being women (71%; see Table 1). The respondents’ age range is wide, from teen-agers to octogenarians, with the majority being 21-40 years old. All the respondents in the localities near Dumaguete City are part-time gleaners, while those in Bais are mainly full-time gleaners (72%) and some who do not have any other occupation (13%).

In Panay Island, 21 respondents were interviewed with an average age of 49 and an average number of years fishing/gleaning of 34 years. Respondents started gleaning at an average of 16 years old. Some respondents mentioned that they started gleaning as a past time activity with friends and mostly referred to their parents who taught them the skills needed for gathering.
Table 1. Number, gender and age groups of gleaners interviewed in Negros Oriental Island, Philippines in a 2012 survey.

<table>
<thead>
<tr>
<th>Item</th>
<th>Cangmating</th>
<th>Agan-an</th>
<th>Bantayan</th>
<th>Piapi</th>
<th>Bais</th>
</tr>
</thead>
<tbody>
<tr>
<td>Female</td>
<td>8</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>72</td>
</tr>
<tr>
<td>Male</td>
<td>22</td>
<td>35</td>
<td>14</td>
<td>14</td>
<td>29</td>
</tr>
<tr>
<td>Total</td>
<td>30</td>
<td>36</td>
<td>14</td>
<td>14</td>
<td>101</td>
</tr>
<tr>
<td>Age range</td>
<td>15-70</td>
<td>15-80</td>
<td>31-60</td>
<td>31-80</td>
<td>15-80</td>
</tr>
<tr>
<td>Mean weighted age</td>
<td>35</td>
<td>42</td>
<td>54</td>
<td>57</td>
<td>40</td>
</tr>
</tbody>
</table>

Catch per unit of effort (CPUE)

The catch per unit of effort (CPUE) was calculated for each gleaner and her/his family members. This is because the catch reported to the interviewer was for the whole family, not just for the parent. The past catch was calculated with the assumption that the effort was the same as in 2012 (at the time of the interview).

Annual catch and value from surveys

The annual catch and income was estimated for Bais Bay and Banate, as: catch * days fishing month\(^1\) * 12 months. The value of the catch is obtained by assuming that the average price of gleaned shells in Bais Bay is at 41 PHP·kg\(^{-1}\) (1 USD·kg\(^{-1}\)) and in Banate Bay is at 20 PHP·kg\(^{-1}\) (0.50 USD·kg\(^{-1}\)).

Results

Negros Oriental Island

The catch is of high diversity, but the scientific names were not acquired; only common names in Cebuano were recorded during the interviews. Parrotfishes (molmol), stonefish (bantol), different species of damselfish, and rabbitfish (danggit) were gleaned. The alga Caulerpa racemosa (lato) is the common marine plant gleaned for food. The invertebrates collected are mainly gastropods and bivalves and the egg mass (reproductive product; lukot) of the sea hare (Dolabella auricularia). The most common and abundant invertebrate collected is the conch (aninikad; Strombus urceus). The catch per gleaning family per day apparently decreased from an average of 0.84 kg of fish, 3.5 kg of invertebrates and 0.35 kg of seaweeds in the 1960s to the current 0.67 kg, 1.9 kg, 0.22 kg, respectively (Table 2). This apparent decline is pronounced in the ‘invertebrates’ that inhabit intertidal habitats, where the biggest decline is more than half of the ‘past’ values, e.g., for Agan-an, and the average decline is about half of the ‘past’ values. The only positive change in ‘past’ and current values is in the ‘fish’ category in Cangmating; the current catch per gleaning family increased by 50% from 1.4 kg to 2.1 kg (Table 2).

In most areas studied, gleaning is an activity that is not monitored by the any government agency.

Agan-an: Gleaning is done by either the mother or father and assisted by about 2 children (mean = 1.8; n = 36). The earliest gleaning experience was in 1963, the latest in 2008, and half of the respondents started gleaning between 1963 and 1980. The harvest is composed of fishes (12%), invertebrates (67%), and seaweed (20%). The implements used are bolo (machete), salok (scoop), and spear. No banka (outrigger boat) is used in gleaning. The number of hours gleaning per day range from 2 to 10 hours per family and on average about 4 hours (3.6; n = 36). The number of days gleaning per month is on average about 4 days (mean = 3.6; range: 1-6 days). Gleaning is done mainly in mud-flats and sea grass beds and
3 kg day\(^{-1}\) composed of 0.13 kg fish; 2.11 kg invertebrates; and 0.20 kg seaweeds (Table 2). Most of the respondents equally consume and share the harvest with relatives; only 3 respondents reported that they consume and sell about half of harvest (53 %) for an income of 275 PHP (7 USD).

**Bais Bay:** Gleaning is done by either the mother or the father in the family assisted by children (mean = 3.4; n = 101). One of the respondents started gleaning in 1948 and another in 2012, but the majority started gleaning in the 1970s, 1980s, and 1990s. The harvest is composed of only invertebrates which are collected with the use of *salok*, *sundang*, *solakab* (fish trap), *bunlay* (a hoe-like tool), and sticks with *banka* (26 %) or without *banka* (74 %). A family spends on average 4 hours per gleaning (range: 1-15 hours per family per day), and, on average, 12 days a year gleaning (range: 3-30 days a year). Gleaning is done mainly over mud-flat and sea grass bed; only 5 % of respondents reported gleaning over reef flat. The catch in earlier periods was mainly invertebrates (52 %) and mixed species (48 %). The present catch is composed mainly of mixed species of invertebrates (92 %). The catch per gleaning family declined from 3 to less than 2 kg day\(^{-1}\) (composed of: 0.29 kg fish; 0.44 kg invertebrates; and 1.0 kg mixed invertebrates; Table 2).  Note that in Bais Bay, data on gleaning are collected by the city government.

An estimate of the 2012 catch of gleaned invertebrates by the *aninikad* fishery of Bais Bay following Equation (1) was obtained with the results presented in Figure 2. The annual catch of 0.48 t·gleaner\(^{-1}\) was obtained assuming an average of 12 days gleaning per month and a weighted average of 3.4 kg gleaned catch·day\(^{-1}\) sold to traders from Bais and Dumaguete cities (range: 0.5-9.0 kg; st. dev.=1.58 kg; n=91). This was valued at a weighted average of 94 PHP kg\(^{-1}\) (2 USD; range: 12-300 PHP or 0.30-7.50 USD; st.
dev. = 69.7 PHP or 1.7 USD; n = 91), or an annual income of just over 45,300 PHP (1,132 USD) if we assume that the fisher’s family at a weighted average of 0.5 kg·day\(^{-1}\) (range: 0.28-3.0 kg; st. dev. = 0.50 kg; n = 67), or an estimated annual catch of 0.0725 t·fisher\(^{-1}\).

Panay Island

Banate, Iloilo: Gleaning is done by either parent or adult and with other members of the family (mean = 1.6; n = 78). The weighted average age of respondents is 55 years and most of the gleaners have been gleaning/fishing for 34 years; and, on the average, started gleaning at 16 years old. NSCB (2008) recorded 87 full-time gleaners in Banate, with about 4% of the municipality’s population engaged in seasonal gleaning. Many implements are used in gleaning, primarily of sea shells in the tidal flats, e.g., pisaw (knife with a metal handle), buna, karali (bait), panuslok (poke), rake, and an improvised shrimp trap (Table 3). Gleaning is seasonal; however, the average number of days gleaning and the duration of the activity do not differ markedly during the in-season (3.2 hours for 10 days) and off-season (3.4 hours for 11 days) periods, i.e., at a monthly average of 3 hours for 10 days over 12 months. The in-season catch at an average of 6.5 kg·gleaner\(^{-1}\)·day\(^{-1}\) is greater than the off-season catch of 1.7 kg·gleaner\(^{-1}\)·day\(^{-1}\); the average catch being 4.5 kg·gleaner\(^{-1}\)·day\(^{-1}\). The weighted average catch per unit of effort is 1.2 kg/fisher\(^{-1}\)·day\(^{-1}\). There appears to be no consensus on the months which can be considered as in-season for harvesting by hand. However, based on observations, the in-season for gleaning comes in May to August, when there is a relative increase in land to sea run-offs due to the Southwest Monsoon (habagat). The off-season period seems to correspond to the dry season in the months of January to April.

Table 3. Implements and their associated catch per unit of effort (kg·day\(^{-1}\)·gleaner\(^{-1}\)), as used by fishers from Banate, Panay Island, Philippines during in- and off-season fishing/gleaning obtained during an interview conducted in 2012.

<table>
<thead>
<tr>
<th>Implement</th>
<th>In-season (May to Aug)</th>
<th>Off-season (Jan to Apr)</th>
<th>Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flashlight, improvised shrimp trap</td>
<td>2.0 7 2.0</td>
<td>2.0 7 0.25</td>
<td>2.6 12 1.5</td>
</tr>
<tr>
<td>Hand</td>
<td>2.0 14 10.0</td>
<td>2.0 14 2.0</td>
<td>2.4 10 7.4</td>
</tr>
<tr>
<td>Panuslok</td>
<td>2.0 4 2.0</td>
<td>- - -</td>
<td>2.3 4 2.7</td>
</tr>
<tr>
<td>Pisaw, buna, karali</td>
<td>3.7 10 7.0</td>
<td>3.7 11 7.0</td>
<td>3.7 11 4.3</td>
</tr>
<tr>
<td>Rake</td>
<td>3.0 15 6.0</td>
<td>- - -</td>
<td>3.0 15 6.0</td>
</tr>
</tbody>
</table>

Shellfish (molluscs and crustaceans) dominates the catch of gleaners with bivalves at 63% of the catch and shrimps and crabs at 17%, while fish makes up only 13% and brachiopods 7%. The most important species caught, i.e., regular staple for this coastal community and sometimes also for upland communities bartering rice, are the bivalves, púnaw (Marcia hiantina; Veneridae, Bivalvia) and litob (Anadara inaequalvis; Arcidae, Bivalvia), together making up more than 30% of the catch (16.5 and 15.3%, respectively; see Table 4). As there was no mention of harvesting for ornamental purposes, we assume that the target species listed in Table 4 are consumed as table food. Marketing and selling depend on amount of the catch, which is sold to either neighbours or to market traders, and some catch are bartered for milled rice or fish. Given an average in-season catch of 6.48 kg·gleaner\(^{-1}\)·day\(^{-1}\), 10.3 days·month\(^{-1}\), and 4 in-season months, an annual in-season catch estimate of 267 kg·gleaner\(^{-1}\) is obtained. Given an off-season average of 0.50 kg·gleaner\(^{-1}\)·day\(^{-1}\), 10.7 days·month\(^{-1}\), and 8 off-season months, an annual off-season catch estimate of 42.8 kg·gleaner\(^{-1}\) is obtained. This gives an annual catch estimate of 310 kg·gleaner\(^{-1}\). Considering that there are 87 fishers regularly gleaning along the coast of Banate, we can estimate that the entire town harvested, in 2012, at least 27 t of invertebrates. Weighted average income from the catch that is sold is estimated at 62.5 PHP·day\(^{-1}\) (s.d. = 31.40; n = 46), or 3.1 kg·day\(^{-1}\) if shells are sold at 20 PHP·kg\(^{-1}\). A similar estimation of annual income can be obtained from the annual catch.
estimate, i.e., at 6,200 PHP·gleaner\(^{-1}\). The majority of the respondents (94\%) commented on an observed decline in the catch, while 6\% mentioned the contrary. This majority singled out population increase in the coastal areas, and the resulting increase in the number of fishers and gleaners as a major factor in the declining catch rates they observed, with erratic seasonality related to climate change also as a possible cause. At least 81\% of the respondents noted an absence of government surveys on the gleaning fishery in the area, with 19\% reporting recent BFAR surveys focusing on cultured and high-valued shells cultured in the area and another that profiled fishers in the area for financial assistance given to affected coastal communities by the M/T Solar II Oil Spill in Guimaras.

<table>
<thead>
<tr>
<th>Species</th>
<th>Family, Class</th>
<th>Cebuano name</th>
<th>English name</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Marcia hiantina</td>
<td>Veneridae, Bivalvia</td>
<td>púnaw</td>
<td>hiant venus</td>
<td>16.5</td>
</tr>
<tr>
<td>Anadara inaequivalvis</td>
<td>Arcidae, Bivalvia</td>
<td>litub or litob</td>
<td>inequivalve ark</td>
<td>15.3</td>
</tr>
<tr>
<td>Portunus pelagicus</td>
<td>Portunidae, Malacostraca</td>
<td>lambay</td>
<td>blue crab</td>
<td>8.24</td>
</tr>
<tr>
<td>Lingula unguis</td>
<td>Lingulidae, Inarticulata</td>
<td>-</td>
<td>spiny shell</td>
<td>7.06</td>
</tr>
<tr>
<td>Saccostrea echnata</td>
<td>Ostreidae, Bivalvia</td>
<td>-</td>
<td>spiny rock oyster</td>
<td>5.88</td>
</tr>
<tr>
<td>Metapenaeus sp.</td>
<td>Penaeidae, Malacostraca</td>
<td>-</td>
<td>Shrimps</td>
<td>4.71</td>
</tr>
<tr>
<td>Merisca capsoides</td>
<td>Tellinidae, Bivalvia</td>
<td>-</td>
<td>capsoid tellin</td>
<td>3.53</td>
</tr>
<tr>
<td>Pitar citrinus</td>
<td>Veneridae, Bivalvia</td>
<td>-</td>
<td>yellow pitar venus</td>
<td>3.53</td>
</tr>
<tr>
<td>Anadara granosa</td>
<td>Arcidae, Bivalvia</td>
<td>litub or litob</td>
<td>granular ark</td>
<td>2.35</td>
</tr>
<tr>
<td>Barbattia foliate</td>
<td>Arcidae, Bivalvia</td>
<td>litub or litob</td>
<td>decussate ark</td>
<td>2.35</td>
</tr>
<tr>
<td>Others</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>30.6</td>
</tr>
</tbody>
</table>

**Discussion**

Gleaners in Oriental Negros and Iloilo provinces landed less than 60 t in 2012. Coastal ecosystems such as bays and mudflats, with extensive intertidal areas that are exposed during low and neap tides (such as in Bais and Banate) are the main source of this catch. Monitoring and management of this important marine resource in extensive gleaning areas are necessary to avoid the loss of this resource.

Management of the resource is crucial because coastal communities subsist it absorbs the impacts of seasonal employment in farming. The gleaned marine organisms are for sustenance (e.g., Ablong et al. 1999; LeBlanc 1997) and livelihood. Gleaning is a family activity and it is not confined to women and children only (LeBlanc 1997). The children assist their parents at an early age (6 years) and learn the skills as they become adults. About 2 children per family will probably glean in the area if they do not have the opportunity to study and work in land-based industries. The presence of men in gleaning is an indication of unemployment in land-based activities (e.g., farming, construction). Some are gleaning due to a break in farming in sugar plantations (LeBlanc 1997). The number of gleaners in the coastal area is related to the socio-economic context of the society.

Gleaning is not only for sustenance, but can also be a livelihood. Gleaning in Negros Oriental is done only during the neap tide each month (evidence – number of days per month gleaning). The exception is in Bais and Banate where gleaning is a livelihood rather than for sustenance. The harvest is sold in the markets of adjacent urban areas (e.g., Dumaguete City in Negros and Iloilo City in Panay). Economically viable gleaning reported for mangrove clams in Iloilo (Primavera et al. 2002) or sea cucumbers in Davao Gulf (Subaldo, 2011), sea urchins in Bolinao, Pangasinan (Talaue-McManus et al. 1995), and large invertebrates in Lagonoy Gulf (Albay; Nieves et al. unpub. rep.) are examples of this. The productivity
and the area of the coast are the possible factors that determine whether gleaning is economically viable as an informal sector (LeBlanc 1997).

The composition of the harvest from gleaning is mainly invertebrates (molluscs, sea cucumber) that live on sandy-muddy substrate or attached to corals, and which are pried loose from the habitat by various implements. The molluscs in the catch are diverse (about 30 species were reported in the late 1990s by LeBlanc 1997) and many are juvenile stages. Fishes are rarely taken as these are mobile organisms – unless they are found trapped in tide-pools on the reef flat. The exploitation of these juvenile stages of diverse species and will have impact on the population sizes of these species and to over-fishing in coastal fisheries.

The sustainability of gleaning as a livelihood will have a positive impact on the population and to the tourism industry that caters to tourists demand for seafood and souvenirs. The meat and shells of the harvested molluscs are important in the fishery and in the handicraft industry (LeBlanc 1997).

The meat from shells has a different importance to those who glean for food. This is a source of protein for the immediate family and relatives. When the harvest is substantial (> 1 kg·gleaner⁻¹), about 50 % of the catch is sold to neighbours. The small income from this sale is used to buy rice and other basic necessities. The status of the habitats in the coastal area and the population of the exploited molluscs are therefore important in municipal waters to reduce the impact of poverty and on the health of coastal communities.

The catch per effort of gleaning has apparently remained the same in Aga-an and Piapi but not in Cangmating and Bais City. The harvest of invertebrates in Cangmating has declined by almost half; while in the past, it was composed of a small group of of invertebrates, it is now mainly composed of numerous species, none very abundant. In Banate, there was also a perceived decline of the historical and present catches. This decline of catch per effort calls for the conservation of coastal area for gleaning and the monitoring of the exploitation rates as the sustainability of the populations of a diverse group of invertebrates secures the food from the sea for the gleaners and the consumers.

Gleaning in Oriental Negros and Banate, Iloilo differs from that reported in Mabini, Batangas (Palomares et al. this vol.), which was mainly recreational, and which is also an important ecosystem service of the intertidal area. The decline of the catch and catch per unit effort in Bais and Banate Bays, which are heavily exploited for food and for income, is more reason to support conservation and management efforts initiated by the local governments (Integrated Coastal Management in Bais City; Banate Bay Resource Management). A donor has offered to provide 1,000 motor boats as part of the Adopt-a-Fisher Program 91. The intention is good but may have detrimental effects given the lack of structural reforms in the fishery (see Discussion in Cabanban et al. this volume).

Acknowledgements

M.L.D. Palomares acknowledges support from Sea Around Us, a scientific collaboration between the University of British Columbia and the Pew Charitable Trusts. We are grateful for the assistance of Daisy M. M. Teves, Merlita P. Palomar, Marian J. Cuba, Mr. Leolito Decipolo, and Ms. Vivien S. Cabanban in conducting and coordinating the survey in Negros Oriental. Sheryl Mesa, NSAP Coordinator, BFAR Regional Office VI (Western Visayas), Winston Barrera, NSAP Enumerator, the office of Banate Municipal Agriculturist, Mayor and local and village officials in Banate, who provided us much needed information. We are grateful to the gleaners themselves who were very cooperative and forthcoming with information.

References


Appendix I: Questionnaire used in the interviews in Negros and Panay Islands

Name (optional): ___________________________________________ Age: ___________________
Ngalan (opsyonal): ________________________________________ Edad __________________
Address: _____________________________________________________________________________

Position in the family (please underline): a. mother b. father c. child
Position sa pamilya (palihug linyahi) a. mama b. papa c. anak
Number of children in the family: ______
Pila ka anak sa pamilya: _______

Education: ___________________________ Employment: ______________________________
Edukasyon: ___________________________ Trabajo: _________________________________

Other business (if any): _________________________________________________________________
Laing Business (kung naa): _______________________________________________________________

1. How many members of the family are gleaning (please tick)?
   a. Mother ___________
   b. Father ___________
   c. children __________ (please write number of children)
   d. all ______________

2. When did you start gleaning (please write year) _______________
3. How many grams/kilo was your usual catch when you started gleaning? (Please tick and write weight in gram/kilo)
   a. fish ____________
   b. parrotfish _______ weight __________
   c. sea cucumber ______ weight __________
   d. sea urchin ______ weight __________
   e. stone-fish _______ weight __________
   f. damselfish _______ weight __________
   g. groupers _________ weight __________
   h. shell ____________ weight __________
   i. seaweed _________ weight __________
   j. other ____________ weight __________

4. How much did you catch usual kilograms of the following? (Please write weight in gram/kilo)
   a. Isda ____________________________ (Palihug I sulat kung pila ka gramo o kilo)
   b. Molmol ______________ timbang ________
   c. Balat (sea cucumber) ___________ timbang ________
   d. Salwaki (sea urchin) ___________ timbang ________
   e. Bantol (Stone fish) ____________ timbang ________
   f. Palata (damsel) ______________ timbang ________
   g. Kuyog-kuyog (groupers) __________ timbang ________
   h. Maninikad (shell) ____________ timbang ________
   i. Gulaman (seaweed) ____________ timbang ________
   j. Others __________________ timbang ________ (Palihug I lista og pila ka gramo o kilo)

5. What is/are your usual method in gleaning? (please tick)
   a. hand __________
   b. use sticks ________
   c. hook-and-line by the beach __________
   d. hatchet __________
   e. xxxxx __________
   f. others (please list) _________________

Unsa ang sige na pama-agi sa pag-panginhas (Palihug og check)?
   a. Kamot ________
   b. gamit og sticks __________
   c. gamit og hook and line gikan sa baybay __________
   d. gamit og hook and line kay og Bangka nga dili di makina __________
   e. sundang __________
6. Do you use vessel when you glean? (Please tick.)
   a. Yes ___
   b. No ___

7. Ga gamit ba mo og sakayan sa pag-panginhas (Palihug check)?
   a. O0 _______
   b. Dili ___________

8. How many hours do each member of the family spend time in gleaning?
   a. mother ______ (number of hours)
   b. father ______ (number of hours)
   c. children _____ (please write how many children); __________ (number of hours)
   d. all __________ (number of hours)

Pila ka oras manginhas ang itig miembro sa inyong pamilya?
   a. Mama ______ (pila ka oras)
   b. Papa _______ (pila ka oras)
   c. Mga Anak ______ (palihug isulat kung pila nga anak); ______ (pila ka oras)
   d. Tanan (pila ka oras)

Do you glean every day? Please indicate and write the number of days per month.
   a. Yes _______
   b. No _______ How many times and number of days per month that you glean?

9. Ga panginhas ba mo kada adlaw? Palihug check og sulat kung ka pila sa usa ka bulan
   a. O0 _______
   b. Dili ________

10. Asa dapita mo ga panginhas (palihug check)?
    a. Coral reef
    b. Sea grass bed
    c. Reef flat

11. Unsa og pila ka gramo man ang makuha ninyo karon sa panginhas (Palihug check og sulat kung pila ka gramo/kilo)?
    a. Isda ________________________________________ (Palihug I sulat kung pila ka gramo o kilo)
    b. Molmol _______ timbang _______
    c. Balat (sea cucumber) _______ timbang _______
    d. Salwaki (sea urchin) ______ timbang ______
    e. Bantol (Stone fish) ______ timbang ______
    f. Palata (damsel) _______ timbang _______
    g. Kuyog-kuyog (groupers) _______ timbang _______,
    h. Maninikad (shell) ______ timbang _______
    i. Gulaman (seaweed) _______ timbang _______
    j. Others ___________________________________________ timbang _______

12. Ang kuha ninyo sa panginhas para lang sa inyong consumo (Palihug check)?
    a. O0 _______
    b. Dili ________

13. Kung dili tanan para consumo,
    a. Pila ka gramo ang ginahatag para sa pamilya? __________
    b. Pila ka gramo ang ginahatag kay kinsa gi baligya (e.g. neighbors, market)

14. Aduna bay tawo gikan sa LGU o sa BFAR nga ga kuha og data/info gikan ninyo?
    a. O0 _______
    b. Wala ____________________________

Kung OO ang tubag sa #12, palihug I sulat ang ngalan sa opisina. ______________________